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- *'Re-wilding' Wales?*
- *A farm's flora*
- *Trydan dŵr*
- *Bees *Fungi *Moths*
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GOLYGYDDOL EDITORIAL

Pan gafodd yr adroddiad ar Gyflwr Natur ei lansio yng Nghaerdydd ym mis Mai 2013 y darlun a gafwyd oedd bod natur yn encilio. Er gwaethaf ymdrechion 25 o sefydliadau cadwraeth ac ymchwil a gydweithiodd i gyflwyno'r adroddiad, mae'r frwydr i oresgyn datblygiadau pobl ar draul natur yn cael ei cholli. Mae'r term 'cynaliadwyedd' wedi'i ladrata – bellach, mae'n golygu popeth a dim byd: mae busnes yn gynaliadwy os gall barhau i weithredu, ni waeth pa niwed amgylcheddol a wneir ganddo – 'allanolion', chwedl economegwyr weithiau.

Eto i gyd, byddai ein hamgylchedd ar ei golled heb holl waith caled llu o unigolion a sefydliadau sydd wrthi'n ddyfal yn ei reoli mewn ffordd ddoeth a gwirioneddol gynaliadwy. Darllenwch am y gwaith hanfodol sydd ei angen i wireddu'r syniad o ailgyflwyno afancod, er enghraifft; a mentrau sydd â'r nod o roi dyfodol mwy disglair i bryfed peillio.

Mae stori Cwm Idwal yn un enghraifft o hyn – atgoffâd amserol o'r ffaith nad yw ucheldiroedd Cymru yn llawn defaid bellach, fel yr honna George Monbiot yn ei lyfr newydd. 'Adfer gwylltineb' yw'r testun, ac mae ganddo'r potensial o arwain at farn eithafol yn y ddau begwn, heb esgor ar unrhyw ganlyniad adeiladol. Caiff yr achos dros 'adfer gwylltineb' ei drafod yn y rhifyn hwn.

Mae rhan gyntaf adroddiad sy'n sôn am y planhigion a welir ar dyddyn arbennig wedi'i gyhoeddi yma. Ac mae adroddiad ar gofnodi gwyfynod dros gyfnod o hanner can mlynedd yn rhoi cipolwg inni ar ein hamgylchedd cyfnewidiol. Mae 'na lawer mwy i'w ddarganfod eto, fel y dengys ymchwil ar wyfynod cliradain a byd bendigedig ffyngau.

Does 'na ddim rheswm pam na all datblygiadau pobl, yn yr hirdymor, gyd-fyw â natur, gan roi ei wir ystyr yn ôl i'r gair 'cynaliadwyedd'. Mae cynllun ynni dŵr bach yng Nghanolfan Parc Cenedlaethol Eryri yn rhoi cipolwg inni ar ddyfodol cynaliadwy o'r fath.

When the State of Nature report was launched in Cardiff in May 2013 the picture it painted was one of nature in retreat. Despite the efforts of the 25 conservation and research organisations which banded together to present this report, the battle to overcome human development at the expense of nature is being lost. The term 'sustainability' has been purloined – it now means anything and nothing: a sustainable business is one that can keep going, regardless of the environmental damage it generates - what economists sometimes call 'externalities'.

Yet our environment would be a whole lot worse without the efforts of a huge range of individuals and organisations intent on its management in an intelligent, genuinely sustainable way. Read about the essential work needed to make the return of the beaver a reality, for example; and initiatives designed to brighten the dismal prospects of pollinating insects.

The story of Cwm Idwal provides one example of this, a timely reminder that the Welsh uplands are not entirely 'sheep-wrecked', a term used in a new book by George Monbiot. Its subject, 're-wilding', has the potential to polarise opinion without leading to any constructive outcome. The case for 're-wilding' is examined in this issue.

An account of the flora of a smallholding and a report on moth recording over 50 years provide a window into our changing environment. There is much more to find out, as research into clearwing moths and a look at the fabulous world of fungi illustrate.

There is no reason why, in the long term, human development should not coexist with nature, and the term 'sustainability' be given back its meaning. A small hydro scheme at the Snowdonia National Park Centre offers a glimpse of a sustainable future.

James Robertson

Lizzie Wilberforce/WTSWW

Re-wilding Wales:

Pandora's Box, or future perfect?

Rhos pastures demonstrate how human disturbance can bring richness and diversity to our countryside

A new book has stimulated debate about the way we manage our uplands. Will this leave a lasting impression, or will it be quickly forgotten? LIZZIE WILBERFORCE considers some limitations behind a superficially attractive vision.

With the publication of *Feral: Searching for enchantment on the frontiers of rewilding*, George Monbiot has sparked passionate debate about the future amongst those working in Wales' natural environment.

His captivatingly articulated vision of transformation in our uplands, of restored natural processes, of vast woodland cover, and of food webs replenished with their top predators, is undeniably compelling. His writing must inevitably touch the heart and mind of anyone who feels an inherent passion for the natural environment. However, the necessarily emotive and persuasive presentation of his case casts aside some of the key constraints facing those that seek to restore wildlife to our uplands, and undervalues many past successes from which we can learn.

Rescue and recovery

It is right and proper to build a shared vision for our uplands, be it defined by images, lists of outcomes, or assessment of function.

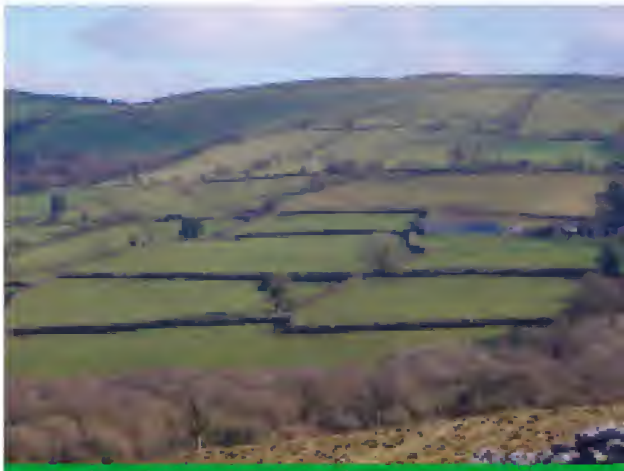
However, to understand how we get there we have to understand our past. Like the economy, one could look at the natural environment as passing between a phase of rescue and into the phase of recovery. Re-wilding describes one style of recovery. Monbiot is consequently highly dismissive of the 'rescue' tools currently applied, which he perceives as narrow-minded and suppressive – the network of SSSIs, the requirement to be prescriptive about presence and abundance of habitats and species. But the law, unfortunately, deals in specifics: in numbers, in limits. This is not a system ideally suited to the management of a natural environment. No conservationist would suggest that this prescriptive approach is the solution to the decline in our habitats and species, but it has allowed us to hold the line in some of the most important places in Wales. Without these sites, we would today be even further from Monbiot's vision.

The value of plagioclimax

Conservation in the UK is often compared to gardening, criticised for trying to halt natural processes and micro-manage features without regard for context. Gardening, farming and conservation are treated as silos, when in fact they are artificial divisions on a single continuum, describing our interaction with our landscape, with varying degrees of interference with and control of natural processes, and at different scales. We should not be frightened of this comparison, because it helps us recognise what we can learn from each other. All are guided by a vision of what we want from the land, directing the way we manipulate natural processes accordingly.

It is fair to argue that conservation currently requires a greater level of interference in the natural process than it should. Like many others, I spend much of my winter cutting and controlling invading willow and birch from wetlands in a bid to halt succession. Where I part ways with Monbiot's assessment of this activity is that I do not do so in the belief that the nature reserve for which I care should be tree-free rhos pasture in perpetuity. I do so because I know that to allow it to disappear under tree cover would contribute to a national trend of net loss. The natural processes treasured by re-wilders are not yet restored, and valuable habitat that is squeezed out of

Lizzie Wilberforce/WTSWW



Parts of rural Carmarthenshire exemplify the critical need for change in our uplands

our landscape is not compensated for by creation elsewhere. I also do so because I believe that rhos pasture has a valuable place in our landscape: yes, it is dependent on human disturbance to maintain a plagioclimax habitat, but it is also incredibly rich in wildlife, supports scarce species, and critically it accommodates our heritage and need for agricultural production within a wildlife-rich environment. Protected sites are not the answer to conservation, they are foundations and models for wider restoration. A future where natural processes are restored would allow the focus to be shifted away from these sites, but their model of diversity in a working landscape will remain relevant.

Charismatic megafauna

Monbiot also argues compellingly for the re-establishment of our natural trophic cascades the reintroduction of large mammals and top predators that would restore the natural balances and improve diversity. There is a strong moral and ecological case for restoring the presence of any native species that evolved alongside our natural habitats. Indeed I would argue that the complete loss of large predators and the total absence of any perceived risk in the countryside may contribute to our modern failure to understand that we are part of a system, not above it. Unfortunately however, unlike mainland Europe, we cannot simply restore habitats and processes and wait for these species to arrive when we have succeeded: as an island we must

Lizzie Wilberforce/WTSWW

Low intensity agriculture can integrate economy, society *and* environment

physically reintroduce them. This creates an entirely different ethical context: do we really know why these species disappeared? For species like beaver and red kite, where human persecution was the direct cause of their decline, and where we can demonstrate that the habitat is still suitable to accommodate them, the process is much simpler. The burden of evidence for the welfare of larger animals we might reintroduce, in a highly altered environment, is rightly much harder.

The integration of people and heritage

The first and greatest challenge we all face is agreeing what our future should look like. For Monbiot and re-wilders, their thinking is not so much about this future as the journey, allowing the natural processes to dictate form; a self-willed landscape. This vision tends to exclude people, with the notable exception of eco-tourism. The danger here is that a landscape devoid of people working the land, in a densely populated country like the UK, can be as dangerous as the attitude that man has dominion over all. An entirely self-willed landscape is, ultimately, a giant nature reserve. Removing the people that manage that land takes our culture one step further away from understanding those natural processes and our natural place within them. It also ignores and displaces our still growing need for resources.

To focus on restoring natural form and function, to the exclusion of all else, is to think one-dimensionally. Instead of tackling the issue of how we can restore these processes whilst continuing to provide fuel and food and protect our agricultural heritage, it presumes that these things are mutually exclusive. Many existing conservation initiatives have demonstrated multi-use landscapes that are rich in wildlife. A model that integrates society is much more likely to secure support and therefore achieve its aims.

Whatever the outcome for our uplands, it is essential that we bring people with us along the path. People will only support and fund what they value, be that through individual donations, grants or, ultimately, government funds and subsidies. This necessitates guiding people to a meaningful interaction with nature, to engender the sense of inherent value that comes so naturally to most conservationists. It also means demonstrating that it enhances rather than threatens their interests. For example the term 're-wilding' itself damages the message to many, suggesting the erosion of civilisation and culture.

Lizzie Wilberforce/WTSWW

Rhos Pil Bach a Pennar Fawr SSSI, Ceredigion. SSSIs have protected key sites in an increasingly ecologically impoverished landscape

Rob Parry/WTSWW

Wet meadows cut for hay provide a valuable resource as well as supporting diverse plant and invertebrate assemblages

Reintroductions also need to be carefully managed and evidence-based, to be confident of viable, healthy populations. If they are to gain credibility, they must be true reintroductions, not headline-grabbing, partial reintroductions that really represent large enclosures and captivity. They must be established within the law, and be based on education and consultation that allow the public to feel confident and respect the presence of those species, creating a culture of value.

The pace of change

Ultimately, much of Monbiot's writing reflects frustration – frustration at a depleted and reined-in environment, which many of us who feel an instinctive connection to the natural environment would recognise. He is right to criticise resistance to change, excessive caution in the movement and zoophobia, and to challenge society's vision of what we want our countryside and uplands to look and feel like. But it is a big ship that we are trying to turn around, and it takes many players to do so. The visionaries, the big thinkers, the publicists, and the champions of differing visions will help lead the way, but we also need to recognise that if we are to secure real and meaningful change towards complexity of form and function in the environment, we need a total change of course. This depends upon the agencies and civil servants, and on non-government organisations, not only for the high-profile projects, but for the subtle changes in policy and law that embed the environment in our economy. The greatest changes for the benefit of our environment are made in offices; by people speaking the language of the economy and politics, by those willing to hold out for the long game. As well as fireworks we need lanterns, to guide us on the long journey ahead.

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Adfer y Gymru wyllt: blwch Pandora, ynteu dyfodol disglair?

Mae llyfr newydd George Monbiot, *Feral*, wedi ysgogi dadl ynglŷn â'r ucheldir. Mae'n sôn am adfer prosesau naturiol ac ailgyflwyno mamaliaid mawr a phrif ysglyfaethwyr. Ond mae llawer yn ofni nad yw pethau mor syml â hynny. Ar hyn o bryd mae cadwraeth yn ymyrryd cryn dipyn â phrosesau naturiol, ond wrth i'r boblogaeth gynyddu mae mwy o bwysau ar ein tirwedd. Nid yw'r syniad o 'adfer gwylltineb' yn bendant eto, ac yn y cyfamser mae'n bosibl y byddwn yn colli rhagor o gynefinoedd gwerthfawr, ac na fydd cynefinoedd eraill yn cael eu creu yn eu lle. Mae'n rhaid i ni ystyried pobl ac amaethyddiaeth. Mae llawer o'r mentrau cadwraeth presennol wedi creu tirweddau amlddefnydd sy'n gyfoeth o fywyd gwyllt. Byddai adfer prosesau naturiol yn golygu na fyddai'n rhaid canolbwyntio ar safleoedd gwarchodedig yn unig, ond bydd eu model o amrywiaeth mewn tirwedd weithredol yn dal yn berthnasol. Mae dull gweithredu sy'n cynnwys cymdeithas yn llawer mwy tebygol o ennill cefnogaeth ac, felly, o lwyddo yn ei amcanion.

Elephant room

***Andy Jones** picks up the debate sparked by George Monbiot's new book* Feral.

Why do box, yew and holly all have such hard wood? Is it because they are very slow-growing, understorey trees or are they, as George Monbiot suggests, adapted to browsing by (extinct) straight-tusked elephants? And could size limits work as a cap on single farm payments... or would landowners just subdivide their farms? It is easy to disagree with some of the 'wild' ideas behind *Feral* and, perhaps, its proposals at the end, but few could argue with the central premise. The British countryside has lost its suite of large wild animals, and it is demonstrably poorer as a result. (Monbiot says that large animals drove a 'trophic cascade', creating natural wealth from the top down.)

But if conservationists have ignored past biodiversity (their 'elephant in the room') then it is farmers – and fishermen – who did the real damage. Monbiot denies them a 'guardians of the countryside' role and, instead, looks to the economics of agriculture, especially in the 'sheepwrecked' Cambrian mountains. He is surely right to single out the malign influence of subsidy and, in particular, the notorious 'rule 12' that requires land to be kept in production. But it is hard to read such flat-out dismissal of this strange, intricate upland and not everything in his description is accurate – or fair. You might see less wildlife on a piece of moorland than in the average suburban garden... but are we just interested in numbers? And if Glaslyn is not the "really wild" place of Montgomery Wildlife Trust's publicity, is it not a cultural landscape, of real interest and meaning? Monbiot too often voices the opinion of 'conservationists' here ("fewer trees", "more grazing") but without real engagement. He would have met far wider views (and surprising agreement) if he had spoken to more conservationists in Wales. By contrast, the farmers and the politicians get a proper interview: AM Elin Jones to hilarious effect; the young farmer Dafydd Morris-Jones delivering a fine and very thoughtful riposte.

Yet, for all its faults (and readers might want to skip sections in the book dealing with memoir and 'nature writing') this is a serious, thorough and perhaps timely work. The recent devastating floods in Wales and England, downstream on the Severn, focus our attention on river catchments and the capacity for water-holding in the uplands. Experiments elsewhere in Britain, most notably Ennerdale, in Cumbria, have shown how reduced grazing can control flash-floods – and also improve water quality, for both wildlife and drinking purposes. And the Welsh Government's new environment / conservation agency, Natural Resources Wales (NRW) is in a unique position to address these ideas, bringing together wildlife and forestry and water management in one place for the first time. In this light, George Monbiot's vision of a wilder, less managed upland Wales is less of a challenge and more like a real plan. If that interests you, then you should read this book. I trust that policy-makers in influential positions will do just that.

***Andy Jones** is Higher Plant Specialist, Natural Resources Wales*

Barbara Jones

Optimism rewarded: Cwm Idwal 15 years on

The Welsh uplands have come in for criticism lately for the intensity of their land management and lack of natural dynamism. In contrast to this gloomy view, one upland National Nature Reserve has been on a journey towards greater diversity and attractiveness, as ***BARBARA JONES*** *and* ***DAVID PARKER*** *report. It should give policy-makers and land managers the confidence that in certain locations, transformation is possible and desirable.*

Cwm Idwal: free from the perils of grazing, saplings are beginning to take hold

In the very first issue of *Natur Cymru*[1], one of us wrote about the uplands in Wales and the potential for change. The article began with a cautionary note about the degraded state of much of the Welsh uplands, years of heavy grazing and over-management resulting in little natural vegetation and swathes of 'bald' grass-dominated hills. In the intervening years little has changed, with most vistas being virtually indistinguishable then from now. However – and how heartening it is to have a 'however' – there are some places where these 12 years have begun to work some magic.

To be a conservationist in the uplands of Britain you have to be an optimist. Things happen slowly, not only ecologically, but also in the grindingly slow wheels of government and EU policy and its application. So, to actually do something and then see the resulting changes happening before your eyes, slowly each year then seemingly in a rush, is almost frightening. The slow creep of heather suddenly fills a whole moraine field until one August morning the place is purple. Or there is so

much Bog Asphodel *Narthecium ossifragum* that the vista looks like a haymeadow. And alpine plants colouring the path-sides purple and white... Can we really make such a difference to our normally sombre Welsh mountains?

Of course we can, and we have done so in Cwm Idwal NNR in Snowdonia, where the removal of grazing sheep in the late 1990s has led to the changes described above and documented by the NNR warden Hywel Roberts[2]. The principal objectives of the removal of grazing were to protect and restore the tall-herb, chasmophytic (rock based), arctic-alpine and montane vegetation, to enable the previously heavily grazed vegetation communities to recover, and to establish a more natural valley-to-mountaintop vegetation transition. The internationally important arctic-alpine plants had been restricted to high, steep rock faces, with little chance of increasing their tiny populations or improving their genetic diversity by gene flow between these isolated fragments. However, since the sheep numbers have plummeted, things are slowly, slowly improving, particularly in the boulder scree and on either side of Twll Du, where Mossy Saxifrage *Saxifraga hypnoides* is now tumbling down over the broken rocky ground; enough to bring a lightness to your step and to your heart as you pass on by. Other alpines are also tentatively

Barbara Jones

Bog Asphodel *Narthecium ossifragum*

Barbara Jones

Purple Saxifrage *Saxifraga oppostifolia*

making their first steps off the vertical faces and finding a foothold on the lower ground where previously they would have been grazed away within hours. See how much Purple Saxifrage *Saxifraga oppositifolia* and Moss Campion *Silene acaulis* there is amongst the stony ground by the footpaths – a sight unimaginable 15 years ago.

Watching change

To quantify and study the direction and rate of change of this management, a detailed surveillance system was established right at the beginning[3] with the aim of determining the long term impact of grazing removal on each vegetation community away from the cliffs. This involved the establishment and recording of a series of 30 square plots in stratified random locations within the NNR. The approach is by way of surveillance monitoring that looks for changes in the structure and composition of the general vegetation cover and identifies changes in the frequency of species and other variables, rather than focussing on pre-selected target indicators. The arctic-alpine and tall-herb vegetation is subject to separate detailed monitoring by Natural Resources Wales under the Special Areas of Conservation (SAC) system.

The latest surveillance data from 2012[4] shows heath increasing, most notably on the better drained ground just above the break of slope around the floor of the Cwm and below the current downslope limit of dwarf scrub. Heather is also very

Barbara Jones

Tall herbs flourish on ungrazed slopes

evident now on the moraines to the south-west of Llyn Idwal. The plants are very conspicuous during flowering, and in some areas contribute almost 100% of ground cover.

The structure of the vegetation is changing with increased height and biomass, but species composition is changing little as yet in terms of number of species. Most variation recorded is primarily in terms of proportional cover of the same species, such as bog asphodel which has increased greatly over much of the Cwm. The rapid re-vegetation of some areas of bare peat by Cotton Grass *Eriophorum angustifolium* is encouraging, but we need a longer period of surveillance to discern trends properly, as 14 years is merely the blink of an eye in the ecology of upland sites. Changes will be slow and so we shouldn't assign cause and effect too quickly: seasonality can still be having an effect over and above that from removal of grazing, climate change and the fluctuating dynamics of small populations.

A few rowan *Sorbus aucuparia* seedlings are growing in the protection of fairly dense acid grassland and a small number of extremely stunted hawthorn *Crataegus monogyna* bushes have managed to survive grazing over many years. However, given the paucity of saplings within longstanding exclosures, their further development may not be governed mainly by grazing. The recruitment of woody shrub and tree species will be interesting to follow in the next ten or more years – keep your eyes open!

Reviving saxifrages

Any accessible chasmophytic or crevice dwelling vegetation will have been grazed in the past, but there are signs now that typical species such as purple and mossy saxifrage are starting to increase in cover. There may be a problem waiting in the wings, however, in the presence of New Zealand willowherb *Epilobium brunnescens*. This is an introduced species first recorded in Edinburgh in 1904, which has since spread to all kinds of damp, bare and rocky ground in the north and west of the British Isles. It has made a home in many of the rocky slopes of Snowdonia and in some calcareous grassland. It is still spreading and its small pink flowers can be seen on any walk through rocky areas. Whether it will impact on the recovering arctic-alpines in Cwm Idwal is something we need to keep a close eye on, although what we could do to prevent this is hard to imagine.

The cliffs which support existing tall-herb vegetation have steep but accessible ledges along their base which were previously heavily grazed. I (Barbara) optimistically call these 'tall-herb ledges in waiting' and recent monitoring in 2012 has supported my optimism by noting signs of recovery with species such as Lady's Mantle *Alchemilla glabra*, Globeflower *Trollius europaeus*, Angelica *Angelica sylvestris*, Water-avens *Geum rivale* and Meadowsweet *Filipendula ulmaria* all responding to the reduction in grazing. This change is clear when comparing photos from 2004/2012, with an increase in the percentage cover and sward height of tall herbs at most points.

We have good information about the plants, but in time it would be interesting to have similar information about changes to the bird and

Barbara Jones

Mossy Saxifrage *Saxifraga hypnoides* in Cwm Idwal, literally "spilling" down the slope.

invertebrate species and populations. There are also still some effects of grazing from sheep and goats, shown by the presence of dung and extent of shoot nibbling. Trespassing sheep numbers in recent years have occasionally reached 250 in the NNR although they are usually much lower. This number is too high, and more shepherding aims to reduce this, but it has to be put into perspective when compared to the much higher levels of grazing in the past. Sheep are still wandering widely within the Cwm, probably influenced to some extent by the presence of visitors.

Although it's tempting to use tabloid headlines and say the changes are amazing, many casual visitors wouldn't even notice any difference, particularly with the presence of 'trespassing' sheep in the Cwm throughout the summer. However, if you know what to look for and where to look for it, a little hyperbole is allowed! These small steps on this one site are part of a vision for a 'less managed Wales', where appropriate areas are left to develop more natural vegetation communities. This project at Cwm Idwal presents a wonderful opportunity, not only to effectively manage and protect rare plant communities, but also to enable a 'natural' vegetation succession to develop from the base to the summit of a mountain in a 'core' area of importance in the Eryri SAC.

Re-wilding misnomer

There are still some concerns however. Some think that this is a forerunner for a rampant re-wilding of the Welsh uplands, that the land will be covered by impenetrable scrub and farmers will be put out of business. This is far from the truth as there are many other places in Eryri (and in Wales) where, from a conservation viewpoint, grazing is needed at differing intensities to maintain important habitats, whether this be relatively heavy grazing for grassland communities or lighter to maintain heath. If we can work with farmers and landowners so that each knows the needs and 'vision' of the other and is prepared to develop a framework to achieve these goals in the long-term,

Barbara Jones

then concerns about wholesale re-wilding should disappear. Re-wilding might be a term we can use to engage with the public, but we know it isn't really wild. Cwm Idwal isn't wild, but it is becoming a whole lot more diverse than many other cwms in Wales.

Some maintain that restoring diversity through agriculture is impossible and that conservation and agricultural management need to be separate. That this is not the case can be seen in a myriad of examples: not least in France, where traditional farming is still carried out in many places, resulting in a superb diversity of plants, invertebrates and birds. France is a highly developed country in terms of agriculture, but has still managed to retain biodiversity in large areas through appropriate agricultural management. Britain's location and island status means that we would never have the diversity found in countries in mainland Europe, but our agricultural and conservation management could be linked so much more effectively to improve even our limited range of wildlife.

Hopefully the Cwm Idwal project has been an inspiration for conservation initiatives on other sites and has highlighted the need for large scale, long-term conservation management in the Welsh uplands. Conservation and agriculture can work together using a framework to guide where each one takes precedence and where they can work together to produce food and wildlife to nurture body and soul. Surely that isn't too optimistic?

Barbara Jones

Tufted Saxifrage *Saxifraga cespitosa*

***Barbara Jones** is an ecologist specialising in uplands and arctic-alpine plant species. She was the Countryside Council for Wales (CCW) Upland Ecologist for Wales from 1999 to 2011. **Dr David Parker** is an independent consultant ecologist, recently Chief Scientist of CCW before its demise.*

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Gwobrwyo gobaith: Cwm Idwal 15 mlynedd yn ddiweddarach

Ym mryniau Cymru mae pori dwys a gor-reoli wedi arwain, yn aml, at ddirywiad yn ansawdd y tir ac amrywiaeth cyfyng o rywogaethau. Maen arbrawf tymor hir, caewyd defaid allan o Gwm Idwal yn Eryri, a gadawyd i'r llystyfiant ymadfer yn naturiol.

Mae arolygon manwl wedi astudio'r effaith tymor hir ar bob cymuned llystyfiant. Gynt, cyfyngid planhigion arctig-alpaidd o bwys rhyngwladol i glogwyni anhygyrch: ond bellach, maent yn ymledu i dir is, lle nad oes pori arnynt. Mae cynnydd amlwg yn y rhywogaethau llysiau tal, megis mantell y forwyn ac erwain; mae grug yn amlwg iawn pan flodeuo, a phlu'r gweunydd wedi ymsefydlu ar fawn moel. Diddorol, ymhen amser, fyddai cael gwybodaeth gyffelyb ynghylch y newid yn y poblogaethau a'r rhywogaethau o adar ac anifeiliaid di-asgwrn-cefn.

Mae'r cynllun hwn yn gam bychan tuag at 'Gymru lai rheoledig'. Mae wedi tanlinellu bod angen i gadwraeth ac amaeth gydweitho, er mwyn deall anghenion ei gilydd. Dylai argyhoeddi llunwyr polisïau a rheolwyr tir fod trawsnewid yn bosibl ac yn ddymunol mewn mannau neilltuol.

Allard Martinius

Bringing back the beaver

Beaver *Castor fiber* Afanc

Returning a large native animal like the beaver to the Welsh countryside is a long way from the self-gratification of 're-wilding' advocacy. It requires the building of bridges, addressing the concerns of those who might be affected; considering practicalities, identifying benefits, drawing up contingency plans - painstaking work. Since the last article on beavers appeared in* Natur Cymru *(22:8), much progress has been made, as ADRIAN LLOYD JONES reports.

Since 2005 the Wildlife Trusts in Wales have been leading the Welsh Beaver Project, which has been investigating the feasibility of undertaking a managed reintroduction of beavers to Wales for the many benefits their presence can bring to wildlife, the environment and the economy.

Beavers (Afancod in Welsh) once lived throughout mainland Britain on rivers, streams and wetlands, and were a key constituent of our native wildlife. Beavers are non-aggressive, very easy to catch, and were extremely valuable in the Middle Ages, with pelts worth up to £10,000 in today's terms. Sadly, they were hunted to extinction in Britain for fur, meat and scent glands by around the end of the Middle Ages, probably disappearing from Wales around the 15th century.

Under the European Habitats Directive, member states are legally obliged to consider the reintroduction of lost species, but there are solid practical reasons why getting beavers back to Wales would be a very good thing.

Beavers are natural managers of rivers and wetlands, performing 'ecosystem services' that can assist many other species, including humans, and they are often described as a 'keystone species' – the analogy being that of the central keystone in an archway that serves to hold up all the other stones.

They are herbivores, eating only vegetation, coppicing bankside trees and creating glades and deadwood, enabling woodland and aquatic flora to flourish. These habitats provide enhanced living space for invertebrates, fish, reptiles, amphibians, birds and mammals.

Beavers live on slow-flowing or still bodies of water, in burrows in banks or in lodges constructed using sticks and mud, which can themselves provide breeding habitat for small mammals and otters. They tend to dam only smaller streams, usually when the more favourable territories (which do not require damming) have been occupied by other beavers.

The resulting pool mosaics provide a complexity of wildlife habitats, and the significantly greater population of aquatic invertebrates these promote can restore resources for impoverished riparian ecosystems. Evidence from Europe and elsewhere shows that beaver dams pose little if any problem to migratory fish stocks and many of the micro-environments they create, such as submerged dead wood, branch bundles, bank-side burrows and clefts, provide lays for large game fish such as Atlantic salmon and refugia for fry.

Water managers

The wetland environments created and enhanced by beavers function as natural sponges that retain water during prolonged dry periods when in-stream water levels are low, and can dissipate and absorb the sudden flows associated with flood events. This function helps to reduce bank erosion, trap sediment and capture nutrients, thus naturally cleaning rivers. So effective can this be that, in 2009, South West Water developed a project to utilise this natural process to capture nutrient-rich

Allard Martinius

Beavers tend to dam only the smaller streams

silts which were leaching through tributaries from the surrounding agricultural landscapes into their strategically important Roadford Reservoir. Unfortunately, although supported by their board, this venture failed as a result of opposition from local protest groups. Beaver wetlands also sequester significant amounts of carbon, so they can also help tackle global climate change.

Beavers tend to stay close to water and dislike wandering far from it, with 95% of activity occurring within 10m of the water's edge, so any adverse impact on land-use is very limited. Beavers do not readily move between catchments, especially within hilly or mountainous terrain, and are a highly territorial species. Their populations are naturally capped by habitat availability, with many dispersing two-year olds dying as a result of fights with existing territory holders. This process ensures that their numbers are limited by the availability of suitable living environment and so cannot increase in an uncontrollable fashion.

Beavers do sometimes cause localised problems that require a degree of management. Dams can be built in the 'wrong' place causing small-scale, localised flooding to occur, and unwanted tree felling can take place. There are, however, well established,

low-cost solutions to deal with these issues, so landholders need not be significantly affected by beaver presence on stretches of river passing through their land. Dams can be modified or removed to reduce or negate flooding effects or prevent adverse impacts on particular aquatic species; and deciduous trees can be effectively protected from beaver coppicing by wire grills placed around their trunks (coniferous trees being generally ignored by beavers).

Beavers can feed on arable crops if they are present within a territory, but damage is usually financially insignificant, highly localised and can be prevented by standard stock or electric fencing. Under normal conditions flood embankments further than 10m from watercourses tend not be vulnerable to beaver burrowing, but beavers can create burrows in flood defences closer than this or during prolonged periods of flooding where embankments are the only dry land available. It is, however, recognized that other burrowing animals such as rabbits and badgers pose a far greater threat as they are not constrained to suitable stretches of nearby water. Measures can be taken to protect flood embankments from animal burrowing and, although this can be costly, the need for it would generally be restricted to a very small proportion of any catchment.

Bringing beavers back

The proposals for a beaver reintroduction to Wales include the establishment of a network of trained volunteer beaver managers that would be rapidly available to deal with beaver-related problems. This would include provision for the trapping and relocation, or humane dispatch of 'rogue' beavers. A similar system works very well in Bavaria, including on the flat Danube floodplain where networks of ditches between arable fields create far more opportunity for human/beaver conflict than would be the case in Wales.

Although beaver impacts can require management, their reintroduction to Wales would be well worth the investment. As well as the benefits to wildlife and ecosystem services, beavers have also proven to be very effective at stimulating local economies, especially if opportunities are properly exploited by businesses.

Beaver-watching is very popular and, as beavers come out at dawn and dusk, seeing them normally involves overnight stays, which helps local guesthouses, campsites, pubs, restaurants and local businesses. The Scottish Beaver Trial in Knapdale has provided hard evidence of this, with many local businesses reporting significant increases in trade as a result of beavers being present in the locality, and one hotel owner reporting an increase in profits last year of £25,000. Working in partnership with the Heart of Argyll Tourism Alliance, the Scottish Beaver Trial has now developed the online Beaver Tourism Toolkit **www.scottishbeavers.org.uk/about-the-trial/beaver-tourism-toolkit/** for local businesses where images, videos, beaver spotting guides and other information are freely available for use by local businesses. A report by Oxford University's consultancy WildCRU suggested that, all things considered, the economic benefits of beavers can outweigh the costs of their management by as much as 100:1, so beaver reintroduction also makes economic sense.

Following extensive site surveys, consultation with key stakeholders and consideration of impacts, six Welsh rivers were put forward as potential areas for the

Adrian Lloyd Jones

Beaver-coppiced trees usually continue to grow, and also create fallen deadwood for invertebrates and fungi.

Adrian Lloyd Jones

Beaver lodge in Knapdale

pilot beaver reintroduction to Wales. These were the Rivers Dee, Glaslyn, Rheidol, Teifi, and the Eastern and Western arms of the Cleddau. Further investigation and consideration has resulted in the Rheidol being chosen as the best site, as it has good habitat within it and its natural topography makes the site very enclosed with little chance that beavers will move to other nearby catchments. It was also agreed that the economy of the local Aberystwyth area would most likely benefit more from beavers being present than the other potential sites, and this was an important consideration in its selection.

Further local consultation is now taking place in tandem with additional investigations into likely economic benefits and legal issues. The Wildwood Trust, which has great expertise in the field of beaver reintroduction, is now an important partner in the project, and the aim is for a release in spring/early summer 2014.

Should this reintroduction go ahead it would be a clear statement of intent that Natural Resources Wales and the Welsh Government take the ecosystem approach to wildlife conservation seriously as a vital element in securing a sustainable future for Wales. Through natural recolonisation and reintroduction programmes, beavers have returned to 24 European states within their former natural range, and no reintroduction has been reversed. We sincerely hope that Wales will be the next in line to get beavers back.

For more information, including downloadable reports and leaflets, visit the Welsh Beaver Project website at www.welshbeaverproject.org or call 01352 755472. The Welsh Beaver Project has a steering group that includes representatives from Natural Resources Wales, the Wild Europe Initiative, Derek Gow Consultancy and individuals with expertise in beavers, beaver reintroduction and freshwater ecosystems.

Adrian Lloyd Jones *works for the North Wales Wildlife Trust, and has been seconded to work for Prosiect Afancod Cymru/Welsh Beaver Project.*

Dod â'r afanc yn ôl

Gallai ailgyflwyno afancod i Gymru ddod â llawer o fanteision. Cafodd afancod eu hela ym Mhrydain yn yr Oesoedd Canol a bu bron iddynt gael eu difrodi'n llwyr. Ers hynny maent wedi cael eu hailgyflwyno i 24 o wladwriaethau Ewropeaidd.

Mae Afancod yn creu amgylcheddau gwlypdir sy'n cyflawni 'gwasanaethau ecosystemau', sy'n gweithredu fel sbwng naturiol yn ystod cyfnodau sych ac yn sugno llifogydd sydyn glawiad trwm.

Mae gwylio afancod yn boblogaidd iawn ac fel arfer yn golygu fod rhaid i'r gwylwyr aros dros nos. Mae manteision economaidd afancod yn gorbwyso costau eu rheoli gan gymaint â 100:1. Fe ddewiswyd Afon Rheidol ar gyfer y prosiect peilot gyda'r nod o ryddhau'r afancod yn 2014. Mae cynefin a thopograffi caeedig cwm Rheidol yn golygu nad yw'r afancod yn debygol o symud i ddalgylchoedd eraill. Fe gymerwyd i ystyriaeth yr effeithiau buddiol ar economi Aberystwyth.

Gaynor Ainscough

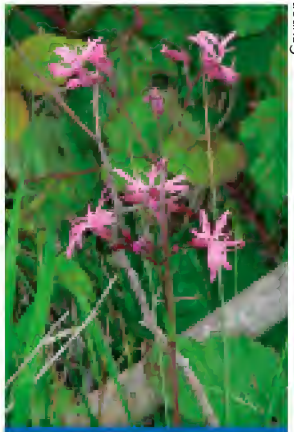
One farm's flora:

a Carmarthenshire smallholding in the 1970s-80s

Self-heal *Prunella vulgaris*

Few of us who grow up surrounded by fields and hedges get to know the names of most of the flowering plants we encounter. An inspiring teacher can change that. NEIL LUDLOW's list of the plants on his farm conjures up the colourful diversity of one small unimproved farm, a richness he hopes to rediscover in the future.

I was fourteen when, in 1974, my family moved from the Bristol suburbs to a smallholding near Drefach in the Gwendraeth Valley, Carmarthenshire. It was my mother's whim, and my father indulged her. None of us had any farming experience, and we kind of made it up as we went along, with advice from those local farmers who felt sorry for us. The holding occupied a gentle, south-facing slope, at the very tip of the long, Carboniferous limestone ridge that continues southwest to the Gwendraeth estuary: right on the edge of the coalfield, it overlooked a large open-cast mine just across the valley. Its 5.8ha (14.5 acres) had never been improved, or artificially fertilized – nor was it to be, under my mother's regime in which we applied only manure and didn't re-seed. We kept a small herd of Guernseys and Jerseys, never more than nine, so the grazing was anything but intensive. Two fields were set aside for an annual hay-cut: the rest were grazed throughout although one, on the valley floor, was too wet and rushy for regular grazing. In truth, the farm was a bit of a Pet's Corner, with a variety of animals including waifs and strays that we'd stepped in to look after. Despite all, we clearly – if


Gaynor Ainscough

Ragged Robin *Lychnis flos-cuculi* Carpiog y Gors

Gaynor Ainscough

Common Spotted Orchids *Dactylorhiza fuchsia*

Gaynor Ainscough

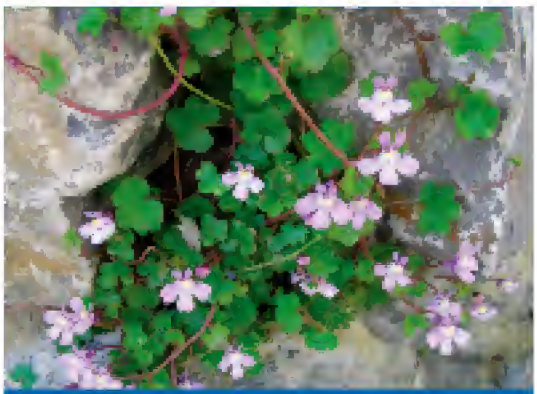
Lousewort *Pedicularis sylvatica* Melog y Cŵn

entirely by default – did something right, as our cattle won prizes in three successive years at the Royal Welsh Show, but the underlying quality of the land was undoubtedly a leading factor. We stopped farming in 1980, renting the fields out for low-density grazing and eventually selling in 1994.

Uprooted from the city, and with none of the makings of a farmer myself, I nevertheless loved every minute of it and was particularly happy at Gwendraeth Grammar School, with its inspirational teaching staff. I'd no real interest in wildflowers until I studied A-level botany under Ieuan Morgan who, in accordance with the syllabus, got us out in the lanes gathering up armfuls of flowers for illustration and dissection. Unthinkable today, perhaps, but it taught me to appreciate them in the most effective way.

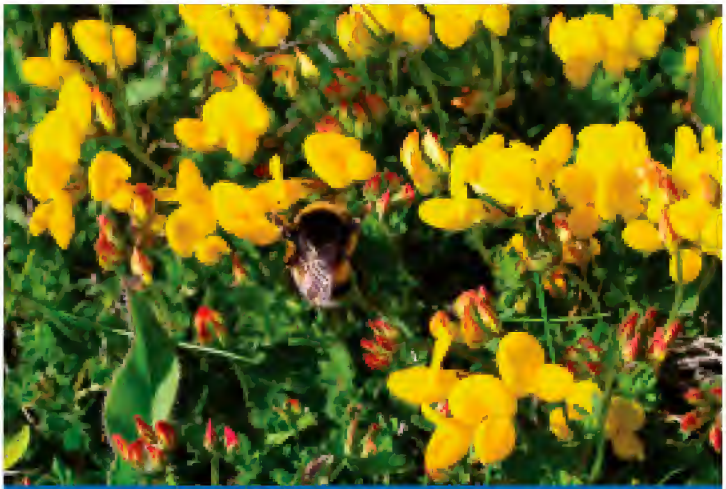
Floral diversity

I listed over 130 species of flowering plant on the farm, not including grasses and sedges, or most umbellifers, composites and trees, as I tended to concentrate on those families that I could identify with confidence and which interested me the most. Although few of them were in any sense rare species, it's the diversity that I recall. And yet I didn't realize at the time how lucky I was – I thought such diversity was more characteristic of the limestones of northern England or the chalk downlands of the south. Living now on the North Downs, I know this isn't the case and, looking back, it seems a pretty rich assemblage.


Gaynor Ainscough

Ivy-leaved Toadflax *Cymbalaria muralis*

There were six fields, all relatively small, averaging 0.8ha (2 acres) each. They supported a wildflower-rich pasture, typically featuring buttercups, clovers, Meadow Vetchling *Lathyrus pratensis*, cinquefoils including Tormentil *Potentilla erecta*, speedwells *Veronica chamaedrys* and *V. serpyllifolia*, Self-heal *Prunella vulgaris* and hawksbeards *Crepis sp.*. Overgrown boundaries, rarely trimmed, sustained numerous mature trees and standards. Oak and ash predominated, with an understorey of hazel, elder, holly, blackthorn and hawthorn beneath a mantle of honeysuckle and Black Bryony *Tamus communis*. In the banks below were foxglove, Dog Rose *Rosa canina*, Tufted Vetch *Vicia cracca*, Red Campion *Silene dioica*, Greater Stitchwort *Stellaria holostea*, Dog Violet *Viola riviniana*, Common St John's Wort *Hypericum perforatum*, Bittersweet Nightshade *Solanum dulcamara*, Common Figwort *Scrophularia*


James Robertson

Common Birds-foot trefoil *Lotus corniculatus*

nodosa, Hedge Woundwort *Stachys sylvatica*, Ground Ivy *Glechoma hederacea*, Wood Sage *Teucrium scorodonia*, Wormwood *Artemisia absinthium*, Hemp Agrimony *Eupatorium cannabinum* and, here and there, gorse.

Closest to the farmhouse was one of the larger fields, grazed year-round and neither manured nor cut for hay. Gently sloping, and slightly drier than the others, it carried a short turf and was particularly good for leguminous plants, with clovers, meadow vetchling, Lesser Trefoil *Trifolium dubium*, Common Birds-Foot Trefoil *Lotus corniculatus*, Greater Birds-Foot Trefoil *Lotus pedunculatus* and, I think, at least one patch of Kidney Vetch *Anthyllis vulneraria*. Also plentiful were Yellow Rattle *Rhinanthus minor* and Red Bartsia *Odontites vernus*, while Common Centaury *Centaurium erythrea* formed an extensive patch. In among the clumps of nettle, thistle, dock, Yarrow *Achillea millefolium* and Common Knapweed *Centaurea nigra* was, however, also Ragwort *Senecio jacobea*, which proved resilient to most of our attempts at eradication. The hedgebanks supported a variety of habitats in which Common Mullein *Verbascum thapsus*, Wild Basil *Clinopodium vulgare*, Woodruff *Galium odoratum* and Wood Sorrel *Oxalis acetosella* could be seen.

Next in line were the two hay fields, also gently sloping. These were manured, and cut once a year. The spikes from a wide range of grasses appeared in summer, while Three-nerved Sandwort *Moerhingia trinervia*, Common Vetch *Vicia sativa* and Columbine *Aquilegia vulgaris* grew in the banks. Alongside the western boundary, which was thick with bluebells in May, ran a stream colonised by Watercress *Rorippa nasturtium-aquaticum*, Water Forget-Me-Not *Myosotis scorpioides* and Brooklime *Veronica beccabunga*. Beneath these fields were two steeper fields of short, unimproved pasture, neither manured nor cut for hay. They again supported a clover/buttercup community, with more ragwort and knapweed, but one of them also took in a patch of Common Restharrow *Ononis repens*. A damp, shady pocket on the western boundary harboured Lesser Celandine *Ranunculus ficaria*, bluebells and Dog's Mercury *Mercurialis perennis*, while Golden Saxifrage *Chrysosplenium oppositifolium* and Moschatel *Adoxa moschatellina* appeared later on.

Plants of the marsh

The sixth field lay on the valley floor, alongside a small tributary of the Gwendraeth Fawr. It was mainly undrained marshland, with a rush and tussock-grass vegetation, but rose slightly at its north end where thickets of bracken and bramble needed some management. The marsh was bright with the mauve of Lady's Smock *Cardamine pratensis* in spring, then progressively deep-pink with Ragged Robin *Lychnis flos-cuculi*, lilac with Common Spotted Orchid *Dactylorhiza fuchsii*, and blue with Devil's-bit Scabious *Succisa pratensis* before frothing with Meadowsweet *Filipendula ulmaria* in late summer. Its flora seemed incredibly diverse, also showing water-cress, Fool's Watercress *Apium nodiflorum*, Marsh Pennywort *Hydrocotyle vulgaris*, Wild Angelica *Angelica sylvestris*, Creeping Forget-Me-Not *Myosotis secunda*, Water Mint *Mentha aquatica*, Marsh Woundwort *Stachys palustris*, Bugle *Ajuga reptans*, Marsh Bedstraw *Galium palustre*, Common Fleabane *Pulicaria dysenterica* and, fringing the stream, Common Valerian *Valeriana officinalis*. On the rising ground were Tutsan *Hypericum*

Gaynor Ainscough

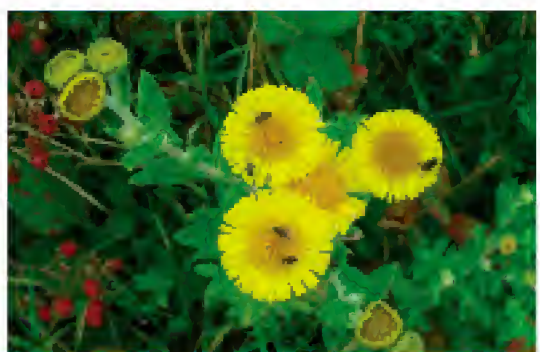
Oxeye Daisies *Leucanthemum vulgare*

androsaemum and a small patch of Lousewort *Pedicularis sylvatica*, while more golden saxifrage and moschatel followed on from the bluebells and Ramsons *Allium ursinum* in the wooded western boundary.

A rough paddock, in which we kept chickens, ducks and geese, was very overgrown with bramble and hogweed. But in the clear spaces grew Oxeye Daisies *Leucanthemum vulgare*, not then a common sight in this part of Carmarthenshire. Alongside them were more red bartsia, Common Knotgrass *Polygonum aviculare* and two species of *Persicaria* (Redleg *P. maculosa* and Water-pepper *P. hydropiper*), Speedwells *Veronica officinalis* and *V. persica*, Betony *Betonica officinalis* and Scentless Mayweed *Tripleurospermum inodoratum*. A collection of brick and stone outbuildings, in various stages of decay, supported White Stonecrop *Sedum album*, Reflexed Stonecrop *S. rupestre*, Navelwort *Umbilicus rupestris*, Ivy-leaved Toadflax *Cymbalaria muralis* and a variety of ferns, while between the buildings grew Black Medick *Medicago lupulina* and Hop Trefoil *Trifolium campestre*.

How many of these species remain? Except to pass by, I haven't really seen the farm since we left in 1994, so I don't know. As far as I can tell from the glimpses I've had, the fields and boundaries are still pretty much as we left them and still unimproved, although the surrounding village has become progressively more developed. I'm planning a visit in spring/early summer next year, so can hopefully provide an update in a future edition of *Natur Cymru*.

***Neil Ludlow** is an archaeological consultant.*



Gaynor Ainscough

Common Fleabane *Pulicaria dysenterica*

Y cofnod blodau

Deugain mlynedd yn ôl symudodd teulu'r awdur i dyddyn yn Sir Gaerfyrddin, lle'i magwyd ef. Cedwid buches fechan o wartheg Guernsey a Jersi ar chwe chae bychan, anghymesur a oedd yn aml yn wlyb, gan gynnwys dwy weirglodd. Ysbrydolodd athro lleol yr awdur i ymddiddori mewn cofnodi blodau'r fferm, a chofnododd ragor na 130 o blanhigion blodeuol: rhestr eithriadol. Mae'r fferm yn dal heb ei gwella, i bob golwg, a bwriada'r awdur ddychwelyd yno er mwyn gweld a yw'r blodau gwylltion yno o hyd.

Fungi ha-ha and fungi peculiar

Pat O'Reilly

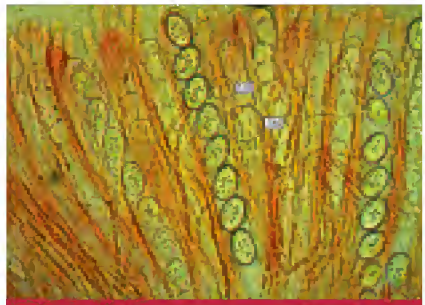
Eyelash Fungus *Scutellinia scutellata*. This alluring little rotter feasts gregariously on damp old timber in cool dark woodlands.

***PAT O'REILLY** finds fungi fascinatingly unfathomable.*

Beauty's wide-eyed innocence is turned to impish seductiveness by long dark eyelashes, but there is something of the night – or perhaps the morning after – when those eyes are hollowed and bloodshot. Mesmerised, I kneel in reverence as they stare up at me unblinking. This is no chance encounter but the culmination of a long-running quest. There had been others, of course, but nothing special. I had always known what I yearned for as I searched in all the right places but, clearly, at all the wrong times. Now at last I know that I have found the right one. Pulling myself together I wipe the embarrassingly stupid grin from my face.

That same childish reaction makes me grin every time I see parrots or puffins at close range – a human trait exploited by clowns and court jesters down the ages. But these aren't birds or buffoons but peculiarly funny fungi – tiny, rare (or, if not, then rarely seen because of their miniscule stature and penchant for damp wood in dark places), and so remarkably like eyes fringed by curved dark lashes.

Eyelash Fungus *Scutellinia scutellata* is a member of the Ascomycota, fungi less formally known as ascomycetes. Most species in this group produce cup-shaped fruitbodies, the majority of which (including the alluring but elusive Eyelash Fungus) are no more than two or three millimetres in diameter. What they lack in size, however, they make up for in fungal fecundity: a single cup produces several hundred thousand spores. Fungal spores are destined to die where they touch down unless the minute mycelial threads that emanate from them meet a mate - and the chances of that are less than one in a million. Were it not so then *Scutellinia* would have conquered the world long ago.



Packed neatly into asci in sets of eight. spores of Eyelash Fungus develop like peas in a pod before being ejected in a fusillade to face the great world outside.

More than meets the eye

Those who shun fungi for fear of being poisoned miss out on the wonders of a kingdom estimated to be at least five times[1] and perhaps as many as 20 times[2] as rich in species as the plant world. There is so much more to fungi than the potential of food for free and the possibility of death by poisoning. Some argue that it is too difficult to separate safe, edible mushrooms from toxic toadstools: it is certainly true that while some species in a family may be highly prized esculents, others in the same family (or even the same genus) are deadly killers. Caesar's Mushroom *Amanita caesarea* is esteemed throughout southern Europe, while Deathcap *Amanita phalloides* is top of the toxic tree and kills many people each year. We have the baddie (sometimes misleading us by wearing a white hat) in Wales, and – who knows? – climate change bring us the magnificent Mushroom of the Caesars.

Fungi get a bad press, and this is surely based more on superstition than science. Are not plants just as risky? Within the family Solanaceae we find tomatoes, potatoes, and Deadly Nightshade. The Fabaceae include edible peas and beans as well as the deadly poisonous Laburnum, whose pod-borne seeds are terribly tempting to a toddler. But most of us approach plants with a quite different mindset.

When we come across a beautiful wildflower, is the first thing we ask "Can I eat it?" No. More likely we wonder what family it belongs to, what name it has been given, why and how it grows in that particular habitat, how it achieves pollination, and so on. There is more to life than predation. In any case, only a tiny minority of fungi are seriously poisonous - but then so are some plants, including peas.

While peas are developing and maturing they are protected inside pods, hidden from seed eaters at least until ripe. A great strategy, but the ascomycetes had the idea first. You need a microscope to see the spores of Eyelash Fungus, which are produced in neatly aligned sets of eight. Each spore set is loaded into a pressurised tube known as an ascus (plural asci – hence ascomycetes), and when the spores are ripe the top of the ascus bursts and a stream of spores is shot into the air. In this respect an ascus is more a machine gun than a blunderbuss, but its range is limited and those flashy lashes must prevent a proportion of the spores from hitching a ride on the breeze. What advantage evolution bestowed on *Scutellinia* via those eyelashes is hard to imagine (although being so cute perhaps they are more likely to escape the inbred mycophobia of *Homo sapiens*).

Pat O'Reilly

Jelly Ear Fungus *Auricularia auricula-judae* is commonly found on fallen Elder trunks and branches, but once in a while it can become rather attached to other kinds of hardwoods.

Pat O'Reilly

A fly feasts on sticky spore-laden gleba on the cap of a Stinkhorn *Phallus impudicus*, which in turn has been tucking in to the residue of a hardwood stump at Gregynog National Nature Reserve near Newtown, Powys.

Lend me your ears

While eyes are both transmitters and receivers of messages, ears are essentially passive receptors: nevertheless, they have not escaped mycotic mimicry. The Jelly Ear Fungus *Auricularia auricula-judae* grows almost exclusively on the dead wood of Elder, the tree on which Judas Iscariot reputedly hanged himself. (Elder would be a coward's choice, as it is rare to find a bough strong enough to take a man's weight.) In their varied contortions human ears rival fingerprints in individuality; but their fungal doppelgangers go further, creating side-splitting caricatures a satirical cartoonist would die for (or risk being killed for).

Other body parts

Not so funny ha-ha when discovered on a tree-lined path through a country churchyard at dusk, another of the ascomycetes produces spores in the gnarled blackened skins of groups of fingers that can look spine-chillingly like long-dead human hands clawing their way from below ground. *Xylaria polymorpha*, a fungus that feeds on stumps and buried hardwood (perhaps including coffins), is commonly known as Dead Man's Fingers - a serious contender for the title of 'The World's Most Aptly-named Fungus'.

Other 'fungi peculiar' replicate human body parts, and most notorious among these is the Stinkhorn *Phallus impudicus*. The Latin roots of its scientific name say all that needs be said about the form of this ostentatious fungus, whose method of reproduction takes nothing from its name. Flies are attracted to a vile-smelling (to us) sticky spore-laden gleba that coats the cap of the fungus, and when a fly has eaten its fill it departs with mucky feet that will deposit spores wherever it next alights. By this cunning means Stinkhorns can distribute their spores throughout dense forests where the air is still.

Gwen Raverat, a grandniece of Charles Darwin, describes how Darwin's eldest daughter Henrietta ('Aunt Etty' to Ms Raverat) took particular exception to *Phallus impudicus:*

"In our native woods there grows a kind of toadstool called in the vernacular The Stinkhorn (though in Latin it bears a grosser name). The name is justified for the fungus can be hunted by scent alone, and this was Aunt Etty's great invention. Armed with a basket and a pointed stick, and wearing a special hunting cloak and gloves, she would sniff her way through the wood, pausing here and there, her nostrils twitching when she caught a whiff of her prey. Then with a deadly pounce she would fall upon her victim and poke his putrid carcass into her basket. At the end of the day's sport the catch was brought back and burnt in the deepest secrecy on the drawing room fire with the door locked – because of the morals of the maids."[5]

Having recruited such effective couriers for spore

Pat O'Reilly

Stumbled upon at dusk, Dead Man's Fingers *Xylaria polymorpha* can come as quite a shock. These creepy ascomycetes sometimes mimic long-dead hands clawing their way up from the grave.

Penny Turner

Alien invaders: the reds are marching northwards. Photogenic but foul-smelling, Red Cage Fungus *Clathrus ruber* has already set up outposts in South Wales.

distribution, why would any member of the stinkhorn family (the Phallaceae) settle for less than optimum spore production capacity? Spore production increases with fertile surface area – bigger is better – and yet to some kinds of stinkhorns that just doesn't seem to add up. It's pretty obvious that the area of the outer surface of a thick-skinned spheroid is greater than its inner surface, and if you cut out chunks from a surface you make its area even smaller. Peculiar to *Clathrus* species is a globose cage-like structure whose inner (not outer) surface is coated with spore-laden goo. Small insects can fly in and out through the holes in the cage whereas larger gleba gluttons would not make it through the gaps. The fatal flaw in the *Clathrus* strategy is that the bars of its cage are not made of iron but of soft fungal hyphae in a form that looks and feels remarkably like expanded polystyrene. Big bugs and other beasts gagging for a gulp of gleba can easily mount a jail break.

Despite any reproductive limitations *Clathrus ruber* is apparently becoming more common in Wales[4], perhaps as a result of climate change. In their own funny-peculiar way these remarkable fungi can be (visually) very attractive; they are certainly not to be sniffed at.

With an estimated 90% of fungi species yet to be located, described scientifically and named, the probability of a new fungus being discovered by an enthusiastic amateur is far higher in the field of mycology than in botany. If that isn't motivation enough for taking an interest in fungi, then just consider their diversity of colour and form. There are more colours in the fungal kingdom than can be found in a rainbow; and the chances are that if you can dream up a new shape, a fungus somewhere has already created it. Imagine!

*Writer and broadcaster **Pat O'Reilly** served on the council of the Countryside Council for Wales for seven years until the recent triple metamorphosis into Natural Resources Wales. Pat's passion for plants is surpassed only by his fervour for fungi. The First Nature website www.first-nature.com, which Pat and his wife Sue develop and manage, receives 0.75 million visits per year, the majority being to the 500+ pages about fungi. Pat's most recent book is* Fascinated by Fungi.

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Ffoli ar ffyngau

Mae gan y ffwng Llygaid Cochion, sy'n fychan ac yn debyg i flewyn amrant, gwpan a all gynhyrchu miloedd o sborau. Fel llawer i ffwng rhyfedd, nid yw'n fwytadwy nac yn wenwynig: ond y mae'n ddifyr. Gall rhywogaethau eraill fod yn iasoer, fel Bysedd y Meirw, neu'n ddigon i beri tramgwydd i rai, fel y Gingroen y bu i ferch Charles Darwin ei losgi'n ddirgel, er mwyn diogelu moesau'r morwynion! Eto, mae yna lawer rhagor o ffyngau nag o blanhigion, ac efallai fod cymaint â 90% o'r ffyngau heb eu disgrifio'n wyddonol, hyd yn hyn. Mae cymaint rhagor i'w ddysgu am ffyngau, ac y maen nhw'n hwyl, hefyd.

A mysterious moth: the Welsh Clearwing

Justin Williams

Welsh Clearwing *Synanthedon scoliaeformis* Cliradain Gymreig

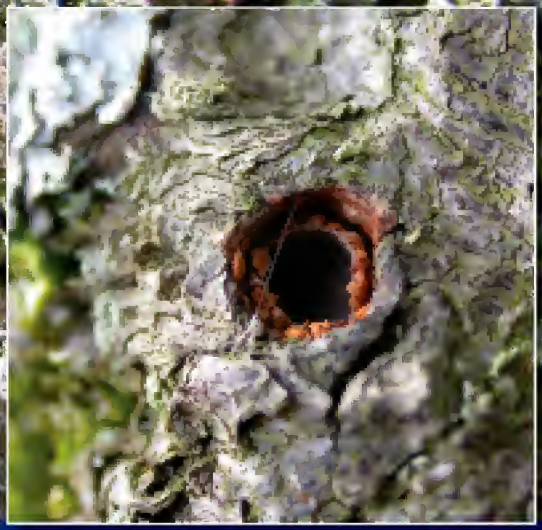
In the Summer of 2012, RHIANNON BEVAN and DAN FORMAN carried out an ecological study of the larval host plant of the Welsh Clearwing, aiming to get a better understanding of its habitat requirements. Here they describe what is known about this fascinating insect, what they have found out, and what remains to be discovered: your observations could help safeguard its future in Wales.

The Welsh Clearwing *Synanthedon scoliaeformis* is a rare and elusive day-flying moth, the larvae of which feed on the inner bark of downy and silver birch. Its flight period is between mid-June and late July: however, in years with particularly poor weather it has been known to extend its flight period into August.

Like almost all members of the clearwing family, the Welsh Clearwing is an excellent mimic, resembling a member of the wasp family in both appearance and flight movement. This, combined with its elusive nature, explains why adult Welsh Clearwings are very rarely noticed. Very little is known of their ecology other than that they have a preference for rearing larvae in the trunks of mature and often isolated birch trees with trunks exposed to sunlight on at least one side.

A Welsh moth

As the name suggests, the Welsh Clearwing was first discovered in Wales, near Llangollen in 1884. However, by the turn of the 19th



Janet Graham

Janet Graham

Exit holes are around 5mm diameter

century it was believed to be extinct in the UK. After an absence of almost 100 years it was rediscovered in 1988, near Dolgellau in Merionethshire. Subsequent surveys around this location uncovered a thriving population from the foothills of Snowdonia to the Berwyn mountains. In recent years, a second Welsh population in Radnorshire was discovered, with many 'tenanted' trees identified in the Elan Valley, and in 2008 its presence in the Wildlife Trust's Gilfach nature reserve on the outskirts of Rhayader was confirmed.

The reason for the species' fragmented distribution in Wales is a mystery, with very few records outside the two known population hubs, despite an ample supply of large, mature birch trees throughout Wales. Outside of Wales, Welsh Clearwings have a

Janet Graham

The male has almost totally black antennae and pronounced orange tail tufts.

Janet Graham

Female Welsh Clearwing: the top third of the females' antennae are yellow and the tails tufts are far less pronounced

similarly patchy distribution, with just two known English populations identified in Cannock Chase and Sherwood forest, and a few scattered populations in Scotland.

There are few species with a history more inextricably linked to Wales than the Welsh Clearwing. A sense of national identity helps to captures the public's imagination when it comes to the conservation of threatened species; indeed there are few Welsh people who do not know of the red kite in Wales, whose fantastic story of conservation success is a tale familiar to many. How many people in Wales are even aware of the existence of the Welsh Clearwing?

Leaving clues – field signs of the Welsh Clearwing

Fortunately clearwings are a family of moths that leave distinctive field signs that are relatively easy to spot if you know what to look for. Welsh Clearwings emerge from cocoons on sunny mornings in the months of June and July. Although this phenomenon is very rarely observed first-hand, round 'exit holes', roughly 5mm in diameter, are left in the trunks of tenanted trees upon emergence of the adult moth.

Sometimes these exit holes are accompanied by the presence of an exuvial casing, which is sloughed from the body of the emergent moth, and can be seen protruding from the exit hole or on the ground nearby. This is often accompanied by small amounts of reddish brown frass. Careful examination of exit holes can also reveal the remains of cocoons, which are spun from frass and bark.

Exit holes may sometimes be confused with the boring activities of other insect species, in particular those of *Rhagium mordax*. However, holes produced by this beetle are often much larger and more irregularly shaped, with copious amounts of pale, sawdust-like frass present at the site of activity.

The adult moth

The clearwings have a unique appearance among moths, characterised by their unusually transparent wings. There are 15 different clearwing species found in the UK. The Welsh Clearwing is identified by the presence of two yellow bands on the abdomen and a heart-shaped black mark on the forewing, accompanied by an orange or red tail tip if female, or a rust brown tail tip if male. They are a medium sized moth, with a wingspan of 30-36mm.

As the adult moths are day-flying they do not come to light, and so cannot be monitored through the traditional light-trap methods used for moth surveying. Fortunately, there are pheromone lures available that can attract both Welsh and other species of clearwing. Although an unreliable method of monitoring Welsh Clearwing populations, they can be useful for determining presence or absence of adult clearwing at a given site.

Janet Graham

Welsh clearwings prefer mature and often isolated birch trees where the larvae can feed on the inner bark.

Monitoring populations

In the Summer of 2012 we undertook a comparative survey of 200 Welsh Clearwing tenanted trees across each habitat type which the species inhabits in England and Wales. The locations chosen were high altitude birch woodland in Merionethshire, mixed woodland and pasture in Radnorshire, and low altitude parkland in Cannock Chase. The aim was to identify the physical and environmental characteristics of tenanted trees that appealed to Welsh Clearwing, in order to better identify and protect suitable trees. A variety of variables were measured, such as number of holes, tree health, surrounding sward height and trunk aspect.

We counted 875 emergence holes across the three sample sites, and it was clear from the numbers that the two populations in Wales were thriving, with 309 holes in Merionethshire, and 418 holes in Radnorshire. It also became apparent that emergent Welsh Clearwings utilised their environment differently in different habitat types. At the highest altitude almost 60% of holes occurred on the warmer, south side of the host tree. Conversely, at low altitude no relationship was identified between emergence and trunk aspect. Similarly, the moths were more likely to emerge on an unshaded portion

Janet Graham

Larval exuvia

The Moths of the British Isles, Second Series, Project Gutenberg. **From the top:** Hornet Moth *Sesia apiformis*; Welsh Clearwing *Synathedon scoliaeformis*; White-barred Clearwing *Synanthedon spheciformis*; Clear Underwing *Paranthrene tabaniformis*; Currant Clearwing (2) *Synanthedon tipuliformis*; Lunar Hornet Moth *Sesia bembeciformis*.

of trunk at higher altitude than they were at low altitude. This indicates the vital role that temperature and climate play in the moth's life history, and indeed raises some interesting questions regarding the future effects of climate change on this insect.

Despite discovering these fascinating aspects of this moth's ecology, the exact characteristics of birch trees favoured by Welsh Clearwing remains a stubborn mystery. Indeed there appears to be no reason why the Welsh Clearwing is not widespread in Wales.

The future of Welsh Clearwings

Given the extent of birch woodland in Wales, it seems highly plausible that there are populations of Welsh Clearwing that have yet to be discovered. Due to its status as a Red Data Book species, it is essential that any such populations are identified in order to safeguard its future in Wales.

An initiative by Swansea Ecology Research Team (SERT) at Swansea University has begun to clarify the distribution of this enigmatic species in Wales, and we are seeking information on past and current distribution records. If you think you have seen a clearwing moth of any species, or evidence of tree occupation by a clearwing moth, please contact us at SERT using the details provided.

***Dan Forman** is Director of Swansea Ecology Research Team (SERT) at Swansea University, and **Rhiannon Bevan** is Researcher with SERT. They can be contacted at: moths@swansea.ac.uk Swansea Ecology Research Team, Department of Biosciences, Swansea University, Singleton Park, Swansea, SA2 8PP.*

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Gwyfyn rhyfedd: y gliradain Gymreig

Mae'r Gliradain Gymreig *Synanthedon scoliaeformis* yn wyfyn prin sy'n hedfan liw dydd. Prin, hefyd, y sylwir arni, a hynny, efallai oherwydd ei bod yn debyg i wenynen feirch. Ail-ganfuwyd hi yng Nghymru ym 1988, gydag arolygon canlynol yn canfod nifer helaeth ohonynt o Eryri i'r Berwyn. Canfuwyd ail boblogaeth, yn ddiweddarach, ym mherfeddion Powys. Mae'r bwlch rhwng y ddwy boblogaeth yn ddirgelwch, er bod digon o gynefin addas.

Mae'r larfâu'n bwyta rhisgl mewnol coed bedw aeddfed, sy'n aml yn rhai ynysig. Tyllau ymadael y gwyfynod aeddfed yn rhisgl y coed yw arwydd eglur af presenoldeb poblogaeth. Defnyddir maglau fferomon i ddenu gwyfynod aeddfed, hefyd. Canfu arolwg gan Brifysgol Abertawe fod tymheredd ac uchder yn dylanwadu'n fawr ar ble maen nhw'n epilio.

Mandy Marsh

Troad y rhod - *adfer twrbein Tan y Bwlch a'r ystyriaethau amgylcheddol*

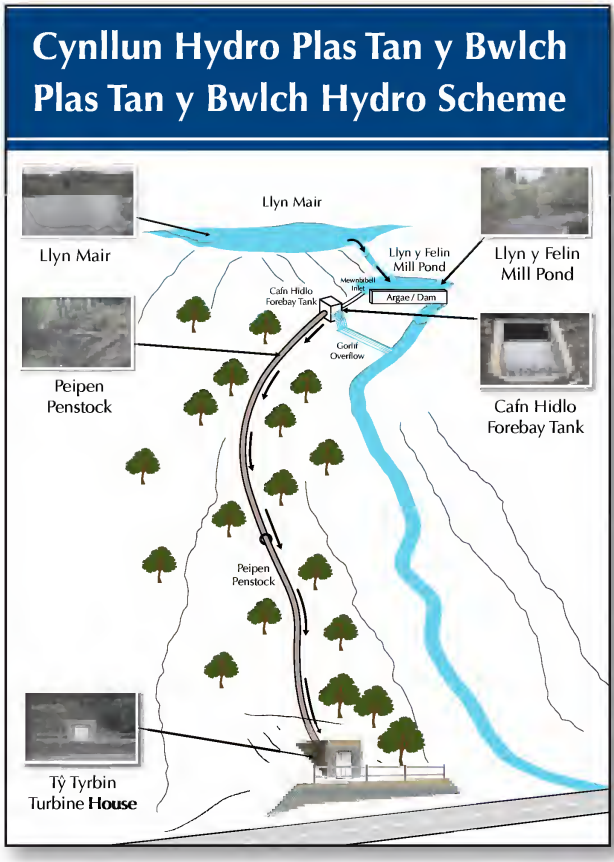
Yr argae
The dam

Nid peth newydd yw cynlluniau trydan-dŵr yn Eryri. Yma mae ***TWM ELIAS*** *yn olrhain peth o hanes y cynlluniau hyn ac yn sôn yn benodol am y twrbein sydd newydd ei agor yn swyddogol ar dir Plas Tan-y-Bwlch eleni – y trydydd cynllun o'i fath yn y Plas. Mae hefyd yn disgrifio'r ystyriaethau ecolegol a oedd yn allweddol i lwyddiant y prosiect.*

Hanes trydan yn Eryri

Roedd Mehefin y 13eg, 2013 yn ddiwrnod pwysig yn hanes Plas Tan y Bwlch, Canolfan Parc Cenedlaethol Eryri, am mai dyma agoriad swyddogol cynllun trydan-dŵr diweddaraf y Plas. Y diweddaraf am mai hwn oedd y trydydd ers sefydlu'r cynllun bychan cyntaf yn 1884, pan oedd y Plas yn un o'r tai cyntaf yng Nghymru i dderbyn ei gyflenwad trydan preifat ei hun.

Roedd y defnydd o bŵer o'r fath yn newydd iawn ddiwedd y 19eg ganrif â'r dechnoleg yn datblygu'n gyflym. Eisoes roedd twrbeinau yn gyrru peiriannau amaethyddol yn Hafod y Llan, Nant Gwynant a buan y manteisiodd peirianwyr a diwydianwyr blaengar y diwydiant llechi yn Eryri ar y potensial newydd, e.e. i yrru peiriannau yn Chwarel Llechwedd yn 1891 ac, yn 1899, i bwmpio dŵr o lefelau isaf Chwarel Croesor yng nghrombil y Moelwyn Mawr a goleuo'r agorydd tanddaearol yno. Tra bo'r ardal wedi ei bendithio â glawogrwydd uchel a chyson drwy'r flwyddyn, onid oedd yn gwneud synnwyr i droi rhodd y cymylau yn 'danwydd twrbein'?



Yn negawd cynta'r 20fed ganrif sefydlwyd tri chynllun trydan-dŵr sylweddol yn Eryri – Dolwen ger Blaenau Ffestiniog (1902) a Chwm Dyli ar lethrau'r Wyddfa (1906) ar gyfer chwareli llechi'r ardal a Dolgarrog (1907) ar gyfer y gwaith alwminiwm yno. Dosbarthai rhwydwaith y *North Wales Power Co.* bŵer i gyflenwi diwydiannau, tai preifat a goleuadau stryd i amryw o drefi'r ardal yn ogystal.

Yn 1904 sefydlwyd yr ail gynllun trydan i'r Plas. Roedd hwn yn fwy o faint ac yn cymeryd dŵr o gronfa yn Nant y Felin ar dir y Plas gyda'r tŷ twrbein i lawr ger y ffordd fawr (A487) i gyflenwi trydan i felin flawd, melin lifio a pheiriannau eraill *Home Farm* y Stâd.

Dros y degawdau nesaf gwelwyd bri mawr ar gynlluniau trydan bychain, gyda chwmni Edwards Llanuwchllyn yn gosod rhai cannoedd ohonynt ar ffermydd yn bennaf, melinau a rhai pentrefi drwy'r gogledd o 1910. Yn eu cyfnod prysuraf, yn y 1920au – 30au, roedd Cymru ac Ardal y Llynnoedd yng Ngogledd Lloegr ar flaen y gad drwy Ewrop o ran datblygu systemau trydan dŵr. Yna, oherwydd yr angen i gysoni grym a chynyddu nerth y cyflenwad aeth y rhan fwyaf o'r cynlluniau bach allan o fodolaeth yn raddol tua diwedd y 1930au gydag ymlediad y rhwydwaith dosbarthu trydan, e.e. bu twrbein 1904 y Plas ar waith hyd 1936 cyn y newidiwyd i dderbyn cyflenwad cryfach o rwydwaith y *North Wales Power Co.*, oedd wedi agor Gorsaf Drydan Maentwrog ar draws y Dyffryn yn 1927.

Tyfodd y defnydd o drydan yn gyflym oddi ar hynny gan chwyldroi bywydau y mwyafrif o bobl erbyn canol yr 20fed ganrif. Cenedlaetholwyd y diwydiant yn 1957 dan y Bwrdd Cynhyrchu Trydan Canolog (*CEGB*) cyn i'r corff hwnnw gael ei chwalu a'i breifateiddio ganol y 1990au.

Diddordeb newydd mewn trydan dŵr

Dros y blynyddoedd diwethaf, yn wyneb costau cynyddol egni a'r angen byd-eang i leihau allyriadau carbon gwelwyd ail-gynnau diddordeb mewn cynhyrchu trydan drwy ddulliau 'gwyrdd' a chynaladwy unwaith eto. Mae cynlluniau trydan-dŵr yn fodd cymeradwy iawn i wneud hynny yn enwedig mewn ardal fynyddig a glawog fel Parc Cenedlaethol Eryri lle gall yr effeithiau ar yr amgylchedd a'r tirlun fod yn weddol fychan. O ganol y 1990au hyd 2011 rhoddwyd caniatâd cynllunio i 7 cynllun trydan dŵr bychan o fewn y Parc, ond bu cynnydd sylweddol ers hynny a chaniatawyd 30 arall erbyn canol 2013.

Yn 2006 y dechreuwyd ymchwilio i briodoldeb ail-sefydlu twrbein ar dir Plas Tan y Bwlch ac i wneud y gwaith mewn modd fyddai'n enghraifft o ymarfer da i eraill ei ddilyn. Polisi Parc Cenedlaethol Eryri yw caniatau cynlluniau trydan bychain mewn safleoedd addas, sy'n ysgafn eu heffaith ar y tirlun a'r amgylchedd. Yn yr achos hwn ni ragwelwyd problemau anorchfygol i'r cynllun newydd ar sail cynllunio – byddai'n defnyddio argae gwreiddiol y cynlluniau blaenorol; y bibell ddŵr yn mynd dan

Mandy Marsh

Cafn hidlo • Forebay tank

ddaear am y rhan fwyaf o'i thaith a byddai'r tŷ twrbin bychan yn cael ei dirlunio'n ofalus. Roedd dipyn mwy i'w ystyried o ran yr effeithiau amgylcheddol.

Safle dan warchodaeth

Roedd gosod pibell ddŵr o argae gwreiddiol Llyn y Felin drwy Goed y Plas, sy'n rhan o Ardal Cadwraeth Arbenig (ASA) Coedydd Maentwrog, i dŷ twrbein newydd, 59m i lawr y llethr at ymyl y ffordd fawr (A487) yn sialens. Byddai'n rhaid i'r bibell ddilyn llwybr drwy goetir aeddfed ar lethrau ceunant oedd wedi ei gynnwys yn yr ACA ar sail y gymuned o goed a phlanhigion, fel mwsoglau ayyb, geir yma a'r defnydd gan wahanol rywogaethau o ystlumod.

Cyn symud ymlaen comisiynwyd cyfres o adroddiadau fel rhan o'r asesiad effaith amgylcheddol statudol oedd yn ofynnol i gynllun o'r fath. Canlyniadau'r asesiad fyddai'n penderfynu tynged y cynllun yn y lle cynta a byddai'n cynnwys argymhellion ar unrhyw fesurau lliniaru angenrheidiol i achosi cyn lleied â phosib o niwed i blanhigion a chreaduriaid dan warchodaeth yma.

Yn 2009 comisiynwyd adroddiad botanegol yn cynnwys arolwg Dosbarthiad Llystyfiant Cenedlaethol (NVC) ac asesiad Bryolegol o'r ceunant a'r goedlan o gwmpas llwybr arfaethiedig y bibell. Yn 2010 cafwyd adroddiad ac arolwg o famaliaid ac adar ac yn 2012 arolwg coed yn cynnwys adroddiad ar effeithiau posib y gwaith arnynt. Ar sail y canlyniadau lluniwyd cynllun gwaith gyda chanllawiau gweithredol cadarn i'w ddilyn gan y contractwyr a'r swyddogion o Adrannau Ecoleg a Choedlannau'r Parc fyddai'n arolygu'r gwaith o ddydd i ddydd.

Y prif ystyriaethau

Dangosodd yr arolwg DLIC y byddai'r bibell yn mynd drwy, neu yn debyg o effeithio ar saith gwahanol gymuned led-naturiol o blanhigion yn cynnwys coedlan dderw gymysg (W10e a W17 yn bennaf) oedd â rhai coed conwydd hynafol yn wasgaredig drwyddynt yn y rhannau uchaf; rhes addurni-adol o goed pisgwydd (*Tilia*) hynafol yn is i lawr a gweirdir (MG10a) yn y berllan afalau uwchlaw'r tŷ twrbin.

Roedd y diddordeb botanegol o ran y planhigion uwch yn gymharol isel yn y goedlan am y bu dan orchudd trwchus o *Rhododendron ponticum* tan ganol y 1970au ac mae rhannau'n dal hyd heddiw dan gysgod trwm coed anfrodorol a ffawydd sydd â'u dail yn ara'n pydru. Cyfrannodd hynny at surni'r pridd, sydd eisoes ar greigiau asidig Maentwrog. Gorwedda'r prif ddiddordeb yn y planhigion is – rhedynau, bryoffytau a chen. Er enghraifft, yn yr

Mandy Marsh

Cuddliwio'r pibellau uwchddaearol
Camouflaging the overground pipes

Twm Elias

Gofal o'r gwraidd - eu lapio mewn geotextile rhag sychu
Roots are wrapped in geotextile to prevent them drying out

arolwg yn 2009 nodwyd 83 o fryoffytau (56 mwsogl a 27 llysiau'r afu) sydd ddim yn nifer uchel, efallai, ond yn cynnwys rhai rhywogaethau o ddiddordeb arbennig mewn 9 llecyn – ar foncyffion coed yn bennaf. Roedd gwarchod y coed hynny yn flaenoriaeth.

Mesurau osgoi a lliniaru

Rhai o'r planhigion i'w diogelu oedd:

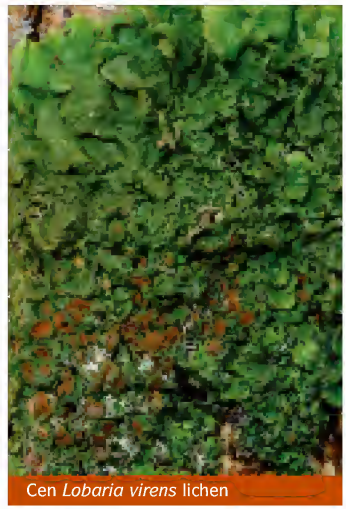
Rhedyn – Marchredynnen bêr (*Dryopteris aemula*) yng ngheunant Nant y Felin. Penderfynwyd y dylai'r bibell osgoi'r ceunant, rhag distyrbio'r pridd ar y llethrau.

Llysiau'r afu – rhywogaethau prin: *Plagiochila punctata* a *P killarniensis* ar fonion coed ger yr afon a *Fissidens curnovii* ar gerrig yn yr afon. Y perygl mwyaf iddynt yw y byddai cyfeirio dŵr drwy'r bibell yn lleihau llifeiriant yr afon ac felly'r lleithder yn y ceunant. I osgoi hynny gosodwyd rhanfa ddŵr ger yr argae i atal tynnu dŵr ar adegau o brinder.

Cen – cafwyd tri math o'r gymuned Lobarion (*Lobaria pulmonaria*, *L virens* a *Sticta fuliginosa*) ar goed aeddfed yn bennaf. I osgoi difrod i'r coed hyn a'u gwraidd dewiswyd llwybr y bibell yn ofalus a sicrhau bod ymgynghoriad trylwyr â'r contractwyr oedd yn gwneud y gwaith.

Mwsoglau – O wybod lleoliad y mathau prin, e.e. *Leucobryum juniperoideum*, roedd yn weddol hawdd eu hosgoi.

Coed unigol – roedd diogelu'r coed aeddfed yn rhan ucha'r safle yn gyfystyr â diogelu'r hyn dyfai arnynt. Gochelwyd rhag difrodi'r boncyffion a hefyd y gwreiddiau – boed drwy niwed uniongyrchol tra yn torri ffos i'r bibell ddŵr neu drwy wasgu'r pridd dan olwynion y peiriannau ac amharu ar y draeniad. Daethpwyd dros y problemau hyn drwy ddewis y llwybr yn ofalus a gosod y bibell ar wyneb y ddaear lle na ellid ei chladdu'n hawdd heb niweidio prif wreiddiau'r coed a'i gorchuddio gyda *geotextile* i annog tyfiant mwsoglau ac ati drosti ymhen amser. Gosodwyd estyll i redeg peiriannau drostynt pan oedd angen gweithio ar lawr y goedlan ac wrth dorri'r ffos i gladdu'r bibell (o leia 500mm o ddyfnder) sicrhawyd goruchwyliaeth fanwl i osgoi torri drwy wraidd fyddai'n dewach na 25mm a gosod y bibell oddi tanynt os yn bosib. Cymerwyd gofal arbennig wrth yrru'r ffos rhwng y coed pisgwydd mawr uwchlaw'r berllan.

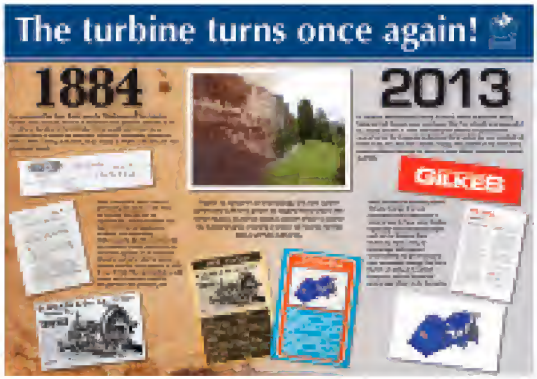


Mike Sutcliffe

Cen *Lobaria virens* lichen

Bywyd gwyllt arall – un o nodweddion ACA'r goedlan yw'r diddordeb o ran ystlumod. Ceir rhai mathau yn clwydo yn y coed hynafol a rhaid oedd peidio gweithio wrth un cwlfert lle mae ystlumod pedol lleiaf yn gaeafgysgu yn y cyfnod Tachwedd – Chwefror. Wrth adeiladu'r tŷ twrbin ymgorfforwyd tri lle gwag yn y waliau â mynedfa iddynt i ystlumod. Ystyriaethau eraill oedd peidio gwneud y gwaith yn ystod tymor nythu'r adar; sicrhau nad oedd llochesi na llefydd gorffwys dyfrgwn

Twm Elias



(sy'n defnyddio'r ardal) yn cael eu heffeithio a bod yn ofalus wrth ddewis llwybr y bibell drwy'r berllan i'r tŷ twrbin i osgoi twmpathau morgrug yn y borfa a'u marcio fel y gallai gyrwyr y peiriannau eu hosgoi wrth agor y ffos. Rhaid oedd bod yn barod am yr annisgwyl hefyd – fel y tro pan achubodd yr awdur neidr wair oedd wedi disgyn i'r ffos!

*Mae **Twm Elias** yn ddarlithydd a threfnydd cyrsiau ym Mhlas Tan y Bwlch, Canolfan Astudio Parc Cenedlaethol Eryri.*

Hydro-electric at Plas Tan y Bwlch

The third hydro scheme at Plas Tan y Bwlch, the Snowdonia National Park Centre, began generating power in 2013. This followed the first small scheme, which was established in 1884, when the Plas was among the first houses in Wales to have its own private electricity supply; and the second, larger scheme, in 1904, which supplied electricity to the flour mill, saw mill and other machinery on the Estate's Home Farm. This scheme lasted until 1936, after which power was supplied by the Maentwrog Power Station.

In the early years of the 20th century there were many small schemes in the area, and interest has now returned to hydro generation, to reduce carbon emissions. Accommodating the high importance for nature of the Plas estate was key to the design of the new scheme. Surveys of the wildlife were carried out, and avoidance and mitigation measures were taken to safeguard the wildlife of the site.

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Bee Cause - *action plan for pollinators*

Plight of the bumble bee

The plight of bees and other pollinating insects has touched the public imagination, and is of very practical concern because of its economic implications. Friends of the Earth Cymru have been campaigning for action to address the issue, and their ideas and suggestions have been taken up in a Welsh Government Action Plan, as BLEDDYN LAKE reports.

Natur Cymru readers will be well aware that bee and other pollinator populations have been in decline in recent years. Factors thought to be responsible include habitat destruction and fragmentation, certain farming practices, the use of pesticides, climate change, parasites and disease.

Thankfully there are several initiatives in Wales to try to tackle this situation. One of these is the Welsh Government's Action Plan for Pollinators (APP), launched by Natural Resources Minister Alun Davies at this year's Royal Welsh Agricultural Show.

This follows a year of feverish activity behind the scenes since previous Environment Minister John Griffiths decided to take up our suggestion of drawing up a plan to help pollinators, and is the first major political breakthrough for Friends of the Earth's (FoE) The Bee Cause campaign. It is the first plan of its kind in the UK and probably further afield too: there are plans to help protect honey bees, but no existing coordinated plans to help protect other species of bees as well as other pollinating insects. It just goes to show that if we have the vision and confidence we

can lead the way here in Wales.

So what is in this new plan?

The first positive step is the announcement of the formation of a new Pollinators Taskforce Group (I have visions of bees in full SAS tactical gear!) to formulate and progress the ideas which the initial stakeholder group came up with, a group which had a good balance of experts from a variety of backgrounds.

There are many welcome proposals in the APP such as:

- Making sure the next Rural Development Plan delivers for pollinators
- Inclusion, where feasible, of biodiversity outcomes to include pollinators within the Common Agricultural Policy (CAP) reform process
- Setting up of an Urban Pollinators Initiative for Wales
- Working through schemes such as Glastir and Farming Connect to provide support to famers to help pollinators
- Providing best practice guidelines to Local Authorities and other land managers on issues such as management of roadside verges, parks and public green spaces
- Including pollinator guidance within the review of sustainable housing policy.

Local Authorities have a major role to play and many are already doing good things, so we are particularly pleased the Welsh Government has taken up our idea of having a pollinator-friendly award scheme for LAs to work towards, similar to the Fair Trade Town scheme. There are also very welcome initiatives for community action, more of which later.

Whilst the APP lacks immediate targets – which some may find disappointing – I believe that it gives us the basis (as long as there isn't any back-sliding) of a very good action plan. So for me, the honey jar is half full.

Pesticides

One thing that was slightly disappointing was the lack of focus on pesticides. These are suspected to be one of the main causes of bee decline and we have called for the UK Government to devolve the regulation of pesticides and biocides to the Welsh Government.

FoE Cymru

Natural Resources Minister Alun Davies supporting The Bee Cause campaign

As Pete Barrar mentioned in his article in the last edition of *Natur Cymru*,[1] there are a lot of concerns around Neonicotinoid pesticides which are systemic, i.e. taken up by treated plants and transported to all the tissues, and hence to pollinators. The worry is that these pesticides, even at low sub-lethal doses, lead to disruption of foraging behaviour, homing ability, communication and larval development.

Earlier this year the European Commission adopted proposals to act on 'neonics'. This followed a report by the European Food Safety Authority linking three of these pesticides to bee decline. There will now be a two-year ban on their use on certain crops whilst more thorough and independent testing and research is carried out. FoE has already persuaded retailers such as B&Q, Wickes, Homebase and Dobbies to remove certain pesticide products from their shelves, and Waitrose has announced plans to remove these chemicals from their supply chains.

Large Mason Bee

In May this year Friends of the Earth launched a new report looking at 12 of the rarest bee species in the UK and their distribution.[2]

One species that has suffered more than most due to its natural habitat being destroyed is the Large Mason Bee *Osmia xanthomelana*, which is the rarest solitary bee in the UK, now found at only two sites on the Llŷn peninsula (Porth Neigwl and Porth Ceiriad). Until its rediscovery in the late 1990s, this bee was thought to have become extinct in the UK.[3]

Its preferred habitat is eroded cliffs of soft-rock such as clay and chalk, landslips, dunes and semi-natural and unimproved grassland, where there is the

FoE Cymru

Bee World at Bron Afon Community Housing HQ in Cwmbran

presence of the leguminous plant Bird's-foot Trefoil upon which it likely depends for its survival in the UK. Climate change and agricultural run-off from nearby intensive farmland are thought to have contributed to its decline.

Since its rediscovery, Gwynedd Council and other experts have made a huge effort to help this bee by thoroughly researching its ecology and habitat requirements, and then undertaking active and informed habitat management that appears to be showing positive results.

New habitats and Bee Worlds

Since the 1940s around 97% of all wildflower meadows in the UK have been destroyed. These were vital areas for bee foraging so it's no surprise that their destruction has affected bee numbers.

FoE has been running a scheme (Bee Worlds) to encourage land owners, schools, communities, businesses and others to replant areas with wildflower seeds to help recreate some of these habitats.

One of these is at Margam Park Discovery Centre in Port Talbot. In April this year, pupils from local primary schools and Ospreys rugby players Jonathan Thomas, Ashley Beck and Matthew Morgan came along to a special day of seed sowing and other pollinator games to mark its launch. Other organisations such as Bron Afon Community Housing Association have enthusiastically got involved in creating Bee Worlds, even having one at their HQ in Cwmbran.

Education and community action

Many children take a natural interest in wildlife and environmental issues, and so make a receptive audience. The APP suggests more information and facilities be provided for schools on the importance of pollinators. We would like a specific target that all schools in Wales be provided with a bilingual education pack and resources allocated or found through partnerships, so that all schools, if they wish, can have access to wildflower seeds and bee-friendly plants to create small pollinator gardens in their school grounds.

We were pleased to see our suggestions of more help for community-led projects being taken up in the APP. But why not think a bit bigger and institute a new annual Pollinator Day in Wales, when communities and schools all around the country come together to hold parties, fairs, fancy dress parades and bee hotel-making activities? That might be a fun, community-driven day to celebrate Wales taking the lead in protecting pollinators.

So how can you get involved?

- Order a Bee Saver Kit from FoE
- Plant bee-friendly plants and flowers
- Buy good quality local honey
- Invite friends and family on a bee walk
- Make bee hotels for solitary bees
- Stop using harmful pesticides and chemicals
- Organise a bee-themed coffee and cake morning and donate the proceeds to FoE
- Follow us on Facebook and Twitter
- Get involved with your nearest FoE group and help create new wildflower areas in your local area.

We could even use events such as these, as well as the various new pollinator projects and initiatives, to help promote 'green tourism' in Wales, thereby contributing to local economies and helping sustain or create new jobs.

One of the nice things about these issues is that we can all do our bit to help and FoE local community groups have been very active over the last two years organising bee-themed events.

Here's just a quick flavour of what's been going on:

- Newport FoE organised a bee fayre and have sigend up local primary schools to plant wildflower areas and make bee hotels
- Bridget Strawbridge, of BBC2's It's Not Easy Being Green, was the star speaker at a 'Plight of the Humble Bee' public meeting in Abergavenny
- Torfaen FoE group held film showings and sowed wildflower seeds at Llantarnam Abbey
- Swansea FoE turned The Swans old football ground at the Vetch Field into a bee paradise by planting wildflower seeds in the new landscaped park there.
- Bee-friendly community gardens have been set up in Llangollen, Wrexham and Caerphilly
- A new Bee World has sprung up in a forest garden in north Pembrokeshire to help school and community groups learn about the issues affecting bees
- Conwy FoE organised a fantastic day for local primary schools at Pensychnant Nature Reserve making 'bee hotels', with the help of North Wales Wildlife Trust, and have another planned at Conwy Orchard later this summer.

And if you are feeling peckish, keep your eyes peeled for a variety of bee-themed menus and events at local independent cafes around Wales this year.

There are good utilitarian reasons for us to get involved in helping bees of all kinds and other pollinators. In addition, there are deeper reasons. As

FoE Cymru

Caerphilly bee hotel

Jacques Yves Cousteau put it, "The happiness of the bee and the dolphin is to exist. For man it is to know that and to wonder at it."

Bleddyn Lake *is a community development officer and bee campaigner at FoE Cymru. He studied Marine Biology and Oceanography at Bangor University and Environmental Conservation Management at the University of Glamorgan. He has been with FoE Cymru since January 2000.*

References

1. *Natur Cymru* 47:31-35
2. www.foe.co.uk/news/regional_bees_report_40066.html
3. *Natur Cymru* 8:28-30

Cadw Gwenyn - Cynllun gweithredu ar gyfer pryfed peillio

Mae niferoedd Gwenyn a phryfed eraill sy'n peillio yn gostwng, yn ôl pob tebyg oherwydd cyfuniad o ddinistrio cynefinoedd, arferion ffermio, plaladdwyr, newid yn yr hinsawdd, parasitiaid a chlefydau. Mae Cyfeillion y Ddaear wedi gwneud cynnydd gwleidyddol bwysig ar gyfer ei ymgyrch Cadw Gwenyn gyda lansiad Cynllun Gweithredu ar Gyfer Pryfed Peillio. Dyma'r cynllun cyntaf o'i fath yn y DU.

Mae'r Cynllun yn dylanwadu ar lefel polisi a hefyd yn cyrraedd pob lefel o gymdeithas. Mae gan Awdurdodau Lleol rôl bwysig i'w chwarae ac mae llawer eisoes yn gwneud pethau da. Ers y 1940au mae tua 97% o ddolydd blodau yn y DU - sy'n ardaloedd hanfodol ar gyfer bwydo gwenyn - wedi cael eu dinistrio. Mae Cyfeillion y Ddaear yn annog tirfeddianwyr, ysgolion, cymunedau, a busnesau i ail-greu'r cynefinoedd hyn drwy blannu blodau gwyllt.

Credir mai plaladdwyr yw un o brif achosion dirywiad gwenyn. Mae Cyfeillion y Ddaear wedi perswadio siopau manwerthu mawr i dynnu cynhyrchion plaladdwyr penodol oddi ar eu silffoedd.

Ymwelwch â **www.foe.co.uk/bees** i gael fwy o wybodaeth neu i gymryd rhan yn eich grŵp Cyfeillion y Ddaear leol.

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Meadows
George Peterken
British Wildlife Publishing 2013
431 pages, H/back £29.95

Woodlands and their ecological history have been the subject of intense research and an impressive literature in recent decades, and, along with Oliver Rackham, George Peterken has been at the forefront of this. Now he has turned his attention to meadows. This volume is in many ways a first, a fact which reveals the difficulty of the subject: meadows are much more ephemeral, their history much more uncertain, their ecology much more entwined with complex, constantly changing agricultural practices, at every scale. How do you tackle such a subject?

Peterken begins by introducing and defining meadows, and quickly the difficulties he faces become clear. They "contribute to a suite of relatively natural habitats" and yet "Many of the semi-natural or unimproved meadows we see today originated as sown grassland", and "perhaps only some old wet meadows have escaped all forms of improvement." Having described the drastic predicament faced by birds, bees and butterflies in a meadow cut for hay, he states: "Hay meadows are not natural." Indeed they have a fluidity about them which makes them hard to pin down. One of the silver linings of the 2001 Foot and Mouth Disease epidemic was the chance to see a surprising number of fields spring up as floriferous meadows, albeit just for one season. A good number of Welsh pastures turned out to be herb-rich.

One of the longest chapters deals with meadow classification, principally as defined in the National Vegetation Classification. It is a source of frustration that many ecologists treat this system as a bible rather than a useful tool. I was therefore pleased to find that Peterken provides a nuanced account of this classification system, into which meadows fit after a fashion. The point he makes, quite rightly, is that you can't have a category for every sample on a continuum, and "every meadow is unique". I was surprised, then, that his response to the distinctiveness of a set of meadows in the Wye Valley was to propose a new sub-community for them, another category. What for? Developing a more and more complex language by which ecologists can describe meadows simply widens the gulf between meadow ecologists and the rest of us.

Having managed my own hay meadows for 15 years, and been involved in meadow conservation and restoration initiatives in Wales for much of that time, my perspective tends towards the practical. In assembling a great deal of material which focuses on the ecology of meadows, Peterken inevitably tends towards the theoretical. Although in places the text is dense, and you have to be either very interested in what he is saying or very determined in your reading, the author is keenly aware of the complexity of the challenge. *Meadows* is an important contribution to a difficult subject.

Meadows borrow from nature, but can be regarded largely as an (agri)cultural phenomenon. In his wonderful book *The forgiveness of Nature – The Story of Grass* (see *Natur Cymru* 4:44), Graham Harvey writes: "The flower-rich hay meadow is a masterpiece of the pastoral arts." Peterken weaves this theme into his narrative, describing, for example, the place of meadows in art and literature. His comprehensive account of the loss of most meadows and the survival of the few is also about the people who began the fight back, which he describes in his final chapter: looking forward. Meadows, Peterken shows, have been abandoned by agriculture, but have many other uses. He may be right, but I don't want to settle for a future in which meadows have no place in agriculture.

The British Wildlife Collection aims to add to the legacy of in-depth articles which have appeared over the years in *British Wildlife*. This volume achieves that aim with the thoroughness and authority with which readers of Peterken's works on woodland ecology will be familiar. As a reader of *British Wildlife* I am delighted to have a copy of this lovely book.

James Robertson

What Has Nature Ever Done for Us?
Tony Juniper
Profile Books
London 2013
324 pages
Softback £9.99

These days, it seems, it's all about us. It's not

enough to protect the natural world simply because it's there, or to ensure our children get to enjoy the wildlife that we can still take for granted. Now, nature has to pay its way, by providing us with 'services' and 'resources'. So, Tony Juniper asks, in a Pythonesque way, "What has nature ever done for us?" And the answer is, like the Romans, really quite a lot.

The chapters take us on a breakneck tour through the natural world, charting how we depend on it and, moreover, how careful management could actually benefit us. After all, why bother to spend millions on carbon capture and storage when the technology already exists. It's called soil, the 'indispensible dirt', as Juniper calls it, that grows more than 90% of our food and recycles our waste into the bargain. Yet more than a third has been degraded in the last 50 years.

After a while, your head begins to swim. Saltmarshes, mangroves, forests, mountains, glaciers, coral reefs, rivers, peatbogs, and even the occasional urban green space are quietly providing us with the essentials of life we take for granted. Species, from coccolithophores to sea otters, by way of vultures, bees, tuna, nettles, frogs and great tits all provide us with services just by living their lives, which we only notice when they disappear. Did you know that nearly half the oxygen in every breath you take comes from marine algae? No, neither did I.

I half imagine the publisher leaning over the author's shoulder whispering "Tony, don't make it too depressing". So the book is leavened with plenty of positive examples of how careful stewardship has conserved nature and saved money into the bargain. Here, the telephone number financial sums involved can just become bewildering. There are the inevitable tales of ecological vandalism and short-term greed destroying the natural fabric on which we depend, but Juniper's tone remains admirably positive; it doesn't have to be this way.

Quite why we seem unable to look beyond the immediate is the subject of the final chapter. Of course, for the very poor, the need for food or shelter can trump long-term considerations. But some attitudes can be truly shocking, like one CEO who commented that, because natural resources are limited, he had to "grab them whilst they are still there". But, for me, more insidious were those who say, in reasonable tones, that there has to be 'balance' between the needs of people and the environment, as if the latter was some abstract 'other' to be protected as an afterthought. Marine Conservation Zones anyone?

It's sad that a simple appeal to do the right thing isn't enough to protect the environment. But if we have to play the ecosystem services game – and it looks like it's the only one in town – we have to play it well. With *What Has Nature Ever Done For Us?* Tony Juniper has produced an absorbing and, in the end, optimistic overview of how the economy is a wholly-owned subsidiary of the environment, that should be a must-read for economists, planners, and politicians. But I suspect the response from many of them will just echo that of John Cleese's Reg from the People's Front of Judea. "Yeah, but apart from food, energy, chemicals, pest control, flood prevention, climate, freshwater and public 'ealth...what has Nature ever done for us...?"

Andrew Lucas

Feral
George Monbiot
Allen Lane 2013
317 pages,
H/back £20

Few new books about nature in Wales (and beyond) have made as big a splash as Monbiot's blast on the 'sheepwrecked', de-natured uplands. He was invited to an exclusive Welsh Government 'by invitation only' gathering at the Royal Welsh Agricultural Show to talk to farmers (and arrived late). His scorn is not confined to the failures of public policy, which result in every household paying £245 a year to farmers through a subsidy system which does much more environmental harm than good. He also ravages timorous nature conservation bodies.

Just to get people talking about the possibilities of a wilder upland landscape, where nature is given the freedom to express itself on a larger canvas, is a signal achievement. But will it do more than just sell books and capture the imagination of his mainly urban audience? Could it stimulate serious debate, which might lead to changes in land use?

Monbiot is an experienced newspaper columnist who knows

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that half truths, like half bricks, carry further. He doesn't let complexity or inconvenient evidence stand in the way of a good argument. If you identify with his values, as many will, you will be carried along with his 'search for enchantment', and enjoy this book. There is much here to make even those with firmly entrenched views sit up and think (except perhaps the Chairman of the National Farmers Union, who says he hates it).

There is also much to regret. He shows no understanding of where the small scale, piece-meal approach to nature conservation came from. It is not a pursuit without ambition or vision. In the 1950s, staff at the fledgling Nature Conservancy, some of whom had worked in the Forestry Service in Africa, had views similar to those of Monbiot: let nature do its own thing and keep human intervention to a minimum. They had to learn the lesson that all habitats in Britain are more or less man-modified, and much of what we value, sometimes for its great diversity, is highly modified. The beauty of nature is in the detail, and the detail needs to be looked after.

A zoologist by training, Monbiot's affinity is with large animals, not the little things. Like an ecosystem, an argument depends on small details, and Monbiot gets enough of these wrong for me to worry about his perspective. Yes, the pollen of *Rhododendron ponticum* was found in interglacial deposits, but it wasn't genetically the same as the cultivar causing all the problems in Snowdonia, despite what he says in the book and repeated on radio.

According to Monbiot, Cwm Idwal NNR is an example of an upland reserve which has been kept in a 'state of desolation' by conservation bodies. I do not see it like this and wonder if he is wearing special grime-covered spectacles. The exclusion of sheep and the glorious results are surely what he wants to see more generally? [see pp 9].

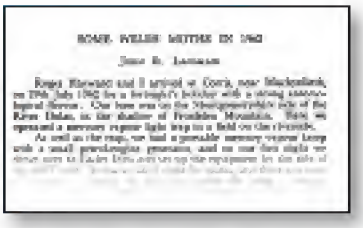
Despite its flaws, *Feral* delivers an impassioned polemic on a subject which interests more and more people. Will it bring about the changes needed? Probably not, but if it rattles a few cages, we should all be grateful.

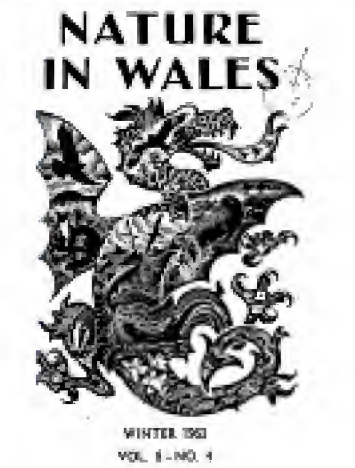
James Robertson

50 Years Ago

Moths and mothing – 50 generations on

***Much can be learnt by looking back at wildlife records from the past, and not just about continuity and change in the natural world. JOHN HAROLD reflects on the study and recording of moths through the lens of an article and Welsh moth list which appeared fifty years ago in* Nature in Wales.**





My first reaction on seeing the article 'Some Welsh Moths in 1962' by John R. Langmaid was to marvel at the longevity which seems to settle around some great naturalists. It is as if nature senses purpose to their lives. John Langmaid is today the country's foremost authority on micromoths. His latest (2013) article in the Entomologists' Record and Journal of Variation is just one of an unbroken run of hundreds of papers communicating his finds of new species, extended distributions and advanced knowledge of the life histories of our Lepidoptera.

The *Nature in Wales* article includes a list of approaching 200 moths which John Langmaid recorded with Roger Hayward near Corris, Meirionydd. Yet he makes no mention of micromoths, which may mean that he was still in the first flush of discovering the 'macro' fauna, or may reflect where he thought the interests of the readers would lie. The author's focus then, is one of the things which has moved on during the intervening half century.

What else has changed? We think of technology as standing proud at the masthead, but Mr Langmaid was catching moths with 'a portable mercury vapour lamp and a small petrol-engine generator', exactly as I did just last week. At that time of course, such equipment may have placed him at the cutting edge of moth recording; I wouldn't know, as it was a few years before I was born. That is a humbling thought – the sheer consistency of action which has built up, record by record, into a lifetime's experience and a towering contribution to the literature.

Moth literature

Other tools used in the study of moths have evolved considerably. The nearest Langmaid would have had to a field guide may well have been Richard South's twin-volume *Moths of the British Isles*. South presented information largely recycled from the Victorians alongside some rather blurry colour plates, but it was for decades the leader in its field. Serious study required a reference collection of set specimens, or access to one. There were years to wait for the next leap forward with the publication, in 1976, of the first part of *Moths and Butterflies of Great Britain and Ireland*. Later John Langmaid was to lead the work on several excellent micromoth volumes in that as yet uncompleted series. Not until 1984 and Bernard Skinner's *Colour Identification Guide to Moths of the British Isles* did moth enthusiasts have a usable field guide to the 'macro's'.

If we cast back a century before the 1963 article we would find Edward Newman busy at work collecting moths, trading livestock – moth eggs and caterpillars, rearing them through to the imago – corresponding, and publishing a monthly journal as "a means of communication between all our principal entomologists". He would also have been working towards the 1869 publication *The Natural History of British Moths*, complete with woodcut illustrations which are simultaneously exquisite and quite useless as a means of making a positive identification of all but the most distinctive species.

The text of Newman's book is a revelation. On page after page he cites observations and discoveries directly from his experience and from that of his correspondents. His

descriptions of caterpillars are often more detailed than those of the 'perfect insect', revealing a more complete grasp of the life cycle and species ecology than that of most modern moth-ers. As a counterbalance, we now have some wonderful resources at our fingertips, which neither Newman nor the young Langmaid could have imagined. The *ukmoths* website **http://ukmoths.org.uk/** and Andrew Graham's *North Wales Lepidoptera* database **www.trawsgoed.com** stand out as works of the highest standard, instantly available, free, and of great practical help in moth study, identification, and recording.

But what of the moths themselves? For 50 generations they have been quietly going through their own lifecycles; spring, summer, autumn, winter; larva, pupa, moth, and egg. Hundreds of species, all facing the obstacles of predation, parasites, weather, and the changing fortunes of their habitats. Fifty generations for the single-brooded, and a hundred generations for the bivoltine species. Through the winter of 1962/3 and the summers of 1976 and 2012. Through the plagues which have convulsed our countryside – agricultural intensification, invasive conifers and the hard-edged engineering of the landscape.

Moths then and now

Dramatic changes alongside a good deal of continuity can be read in Mr Langmaid's list. An obvious highlight was a true North Wales speciality, whose distribution and abundance has probably been far more consistent than its nomenclature. Newman knew it as *Agrotis ashworthii*, Langmaid as *Amathes ashworthii*, and I know it as *Xestia ashworthii*, though we would all have recognised it as Ashworth's Rustic, and in recent years it has acquired an additional name – Gwladwr Cymreig. It remains abundant in widely scattered locations across Snowdonia – I caught a dozen or so in Dinorwic during July of this year. Whilst Newman only knew it from the Llangollen area, this almost certainly reflected a lack of recording in the remoter parts of northwest Wales.

Similarly reassuring and familiar is the whole paragraph dedicated to the taxonomic mess of the Scarce Footman and the Northern Footman. Recording this group has long been something of a lottery, as only those who routinely examine the hindwings would be likely to record the darker examples as Northern Footman. While some of the literature continues to present Northern Footman as an endemic with Red Data Book status, others now see it as simply an ecotype of Scarce Footman. Mr Langmaid commendably came to the latter conclusion, but he did so without the benefit of 50 years of further observation.

All photos Helen Bantock

Ashworth's Rustic *Xestia ashworthii*
Gwladwr Cymreig

Male Satin Beauty *Deileptenia ribeata*
Rhisglyn sidan

During his fortnight of moth study, Mr Langmaid recorded single specimens of Triple-spotted Pug, Brussels Lace, and Satin Beauty, all of which he was "astonished to find in North Wales". None of those

Northern Footman *Eilema complana f. sericea* Troedwas sidanaidd
and Common Footman *Eilema lurideola* Troedwas cyffredin

Devon Carpet *Lampropteryx otregiata* Brychan Dyfnaint

Tawny-barred Angle *Macaria liturata* Seffyr rhesen winau

Barred Red *Hylaea fasciaria* Cochyn Rhesog

Privet Hawkmoth *Sphinx ligustri* Gwalchwyfyn yr yswydd

species would elicit such a reaction today, as they are now known to be widespread in their respective habitats here. In the same vein a record of Devon Carpet is detailed in full: today it is nearly ubiquitous in the rush pastures and wet woodlands where Marsh Bedstraw thrives.

We can be certain that the distribution of Satin Beauty has expanded dramatically, benefitting from the spread of conifer plantations, as have two species he mentions as occurring in great numbers – Tawny-barred Angle and Barred Red. Though there is no mention of the habitats he trapped in, we can conclude from this that he was amongst the pine and spruce of the still-novel Forestry Commission plantations.

The most revealing records may be those species listed at the end, without comment; too familiar to be worth highlighting, 50 years ago. The Privet Hawk-moth may have been undervalued because the species was common – and "urban" – in Mr Langmaid's stamping grounds in southern England. The V-moth, however, is a species I have never seen, and one which has undergone a long and severe decline across its whole range. The currant and gooseberry bushes which fed its caterpillars have long-since disappeared from smallholdings and gardens, victims of year-round availability of supermarket fruit.

A young man who works in conservation recently remarked that the database he was using included records from the 1990s, implying that such old clutter should be cleared out more regularly to keep the thing up to date. He could learn a thing or two from Mr Langmaid.

John Harold *works in the Biodiversity Unit at Gwynedd Council and carries out freelance ecological consultancy.*

Hedgerow Harvest

Autumn is a great time to witness the bounty of nature in full cry and as the flowers of summer fade away fruits, berries and seeds are in abundance. Both in the wild and our gardens there are terrific displays to be seen. Hedgerows abound with sloes, hips and haws, and our gardens are blessed with a dazzling array of fruits and seeds of exotic ornamental plants; all providing welcome food for birds, insects and, for that matter, us.

Children of the war years and the austerity of the 1950s will well remember rosehip syrup. During the Second World War rosehips were seen as a solution to providing vitamin C: nutritionists had known since the 1930s that they have a higher proportion of vitamin C than any other common fruit or vegetable. When the war started to disrupt our supplies (especially of citrus fruit), the Ministry of Health initiated a scheme for voluntary collection of rosehips. Towards the end of the war County Herb Committees had co-ordinated rosehip collection and the annual harvest was over 450 tons a year. Rosehip syrup is still commercially available, but it is simple to make your own and great on yogurt, porridge or diluted with water as a cordial.

Back in the 1970s there was a trendy "food for free" movement: books were published and media personalities created a livelihood telling us what we could harvest for free. In truth, much of this wild harvest was time-consuming and the results often bland or just plain inedible. Hopefully we are not hurtling towards Armageddon where it will be an imperative to find food, but a fresh look at Nature's bounty, particularly at this time of year, does have its merits. A wonderful "ketchup" can be made using hedgerow fruits like haws, hips, rowans, elderberries, sloes, or any combination, and is great with cold meats, soft and goats' cheeses and of course the Christmas turkey.

***Simon Goodenough**, Curator, The National Botanic Garden of Wales*

Letter to the Editor

With regard to the article on Crug-y-byddar churchyard by Julian Jones (*Natur Cymru* 47:40-42), Natural Resources Wales maintains a record of over 1000 lowland grassland sites throughout Wales, with detailed NVC plant community surveys to facilitate the selection of SSSIs. This gives us a scientific basis for site selection according to guidelines common across the UK.

I visited Crug-y-byddar churchyard in 2008 and can confirm that the meadow has areas of species-rich grassland, much of which is NVC 'crested dog's tail – common knapweed grassland (MG5)'. As Julian notes, examples of this community are usually expected to be at least 0.5 ha for SSSI selection. This threshold is not entirely rigid: in exceptional circumstances smaller sites might qualify if, for example, they support exceptionally rare vegetation or are the only example within a specified area (usually district). Radnorshire has 30 sites with at least 0.5 ha of MG5, over 20 of which are already SSSIs.

Size matters in assessing conservation value of habitat; small sites may not retain viable populations of associated invertebrates or scarce plant species. You have to draw the line somewhere, and 0.5 ha is the usual threshold for most forms of species-rich grassland adopted by each of the UK statutory nature conservation bodies.

The SSSI series is designed to protect key examples of habitats and species, and cover the full range of variation, but it cannot protect all sites. There will always be a need for measures such as agri-environment schemes, local authority designations and private initiatives, to conserve habitat examples which fall outside the scope of statutory protection. For this site a conservation covenant, perhaps brokered by the Wildlife Trust, might be more appropriate. Crug-y-byddar supports high-quality grassland: it may be too small to qualify as an SSSI, but it nevertheless warrants conservation for future generations to enjoy.

***Stuart Smith**, Grassland Ecologist, Natural Resources Wales*

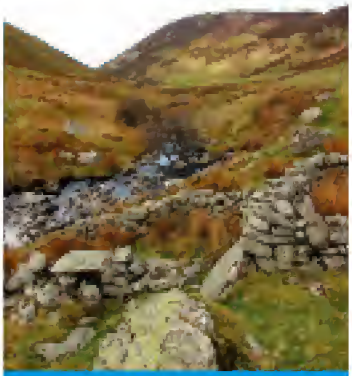
New lichens from Welsh rivers

The rocky banks of rivers and streams are stressful environments, sometimes submerged in floodwater, at other times baking in the sun. Stones and even boulders can be shifted by floods, and rocks may be scoured by sediment. A special assemblage of lichens lives here. Stream lichens differ from each other in their need for moisture and their tolerance of drought, and a zonation of species is often seen, with species lower down rarely emerging above water, and those at the top only covered in the wettest weather.

Recent surveys of Welsh streams and rivers suggest there is still much to be learned, as a number of species new to Britain and new to science have turned up. During a survey of the rare *Endocarpon adscendens* on the River Usk, I found an odd-looking specimen of one of the dark lichens that contain cyanobacteria as their partner. I had collected this mystery species as long ago as 1994 beside the Afon Teifi, and later on the River Wye, but put it aside unidentified. A fresh attempt to find a name showed that it was *Leptogium magnussonii*, never before reported for Britain, but known from the southern parts of Norway, Sweden and Finland, though uncommon there. DNA sequences prepared from the Wye and Usk specimens confirmed that they were the same species and that they were not merely a strange morph of one of the known British species.

Leptogium magnussonii is a good example of a species that needs 'sunny riverside rocks', a habitat recognised and promoted by

Amgueddfa Cymru/NMW



The Afon Anafon, a typical upland stream, home to *Aspicilia zonata* and other uncommon lichens

PlantLife[1]. The rare rocky stretches on lowland rivers may have always provided refuges for such lichens: tree growth is limited on extensive rocks (though trees are amazingly tenacious), and the broad channel acts as a natural break in the tree canopy, allowing sunlight to penetrate to the water. Rivers including the Teifi, Wye and Usk have examples of these special places which deserve to be cherished and enhanced, for instance by controlling excessive growth of trees and scrub.

As lichens go, *Leptogium* is large. The smaller, crust-like species are more of a challenge to identify. Two genera notorious for their difficulty are *Aspicilia* and *Verrucaria*. Both have produced surprises during recent surveys. I recently confirmed *Aspicilia zonata* new to Britain while visiting the Afon Anafon in North Wales: it needs to be looked for elsewhere to see if it is really rare or just overlooked. A mystery *Verrucaria* beside the River Usk turned out to be *Verrucaria squamulosa*. Again I was reminded of an earlier specimen, and realised that I had collected the same thing a year previously on damp brick foundations on the site of the former, notoriously dirty, Phurnacite Plant at Abercwmboi. It seems that this particular species needs only a little moisture and a calcareous substrate, and is otherwise not fussy. Most river species are strongly tied to clean and unspoilt watercourses.

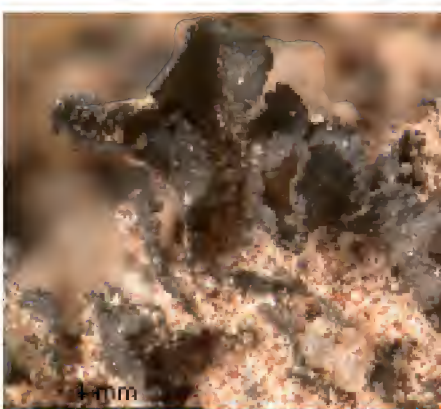
I have reported these species because they have names. More exciting to me are the apparently undescribed entities in *Aspicilia*, *Verrucaria* and others, which are out there on Welsh rivers. Understanding these will need more surveys and more work in the lab.

***Alan Orange** is the lichen taxonomist at Amgueddfa Cymru - National Museum Wales.*

Reference

1. PlantLife, 2013. *Mosses and lichens of sunny riverside rocks - and how to look after them.* PlantLife [leaflet].

Amgueddfa Cymru/NMW



The dark brown leafy lobes of *Leptogium magnussonii*

Gloom or hope? – an update

Blaise Bullimore *updates his assessment of the prospects for marine nature conservation which appeared in* Natur Cymru *47 (Summer 2013).*

The scores are in and it's marine conservation nul points. It is back to the drawing board for possible new Marine Conservation Zones (MCZs), and the dashing of any hope that Skomer Marine Nature Reserve (MNR) might become an MCZ with even slightly improved protection in the foreseeable future.

Alun Davies, Minister for Natural Resources and Food, made his expected statement on MCZs and Marine Protected Areas (MPAs) in Wales on 18 July. Welsh Government (WG) aspirations for the marine environment's future were made clear: ensuring Welsh seas and their biodiversity are healthy and robust enough "to support the demands we put upon them now and in the future", since many people in Wales rely upon and use them "to support their livelihoods and recreational activities". This utilitarian vision becomes even clearer with reference to developing WG's "blue growth agenda". Nothing about biodiversity or wildlife conservation for either their inherent importance or even for the ecosystem support functions that marine biodiversity underpins. It's crystal clear: the economy first, marine environmental conservation a poor second.

The Minister told us we need to understand more about the wide range of marine habitats and species that are already protected. Yet the MCZ consultation document listed over 140 relevant survey and monitoring reports. We can always do with knowing more, though we'll never know everything our opponents demand.

We're also told that (another) assessment of Wales's current MPAs will be commissioned to identify any gaps and the options to fill those gaps. Is it too much to hope that by "gaps" he means both deficiencies in the protection of biodiversity in existing MPAs and some omissions from the network of sites? But gap filling, we are told, will need to be "proportionate". Could this possibly be code to indicate that long-term conservation measures, of benefit to all of society, mustn't get in the way

Blaise Bullimore

Out of sight, out of mind: few people get to experience marine wildlife in its natural habitat, or to witness its destruction.

To the Editor:

I was interested to read the article "Marine Conservation in Wales" in your magazine no 47. It seems to me there is a lack of interest in this subject because of lack of information. There are frequent references to damage being caused to marine areas but almost no pictures showing mature areas, before and after scallop dredging, with follow-up pictures showing how long it takes for recovery. People, myself included, are left to imagine the havoc caused. What happens under the sea is hidden from the large majority of people and the conservation issues seem not to be illustrated. I feel that all the effects of damaging agents need to be visually publicised to show what is happening and to stimulate interest.

Yours faithfully
John Ferguson

of the short-term economic interests of a few? The statement also refers to 125 current MPAs covering 36% of Welsh seas. I mentioned previously how the simple quotation of the percentage of sea that is "protected" is deceptive, but alluding to this apparently large number of MPAs is far more disingenuous.

Most of these "MPAs" are intertidal Sites of Special Scientific Interest (SSSI), many primarily designated for wildlife features such as birds, and salt marshes, or designated sites that are nested one within another. Carmarthen Bay & Estuaries European Marine Site (EMS), for example, includes two Special Protection Areas, a Ramsar site and 17 SSSI within its footprint - so that takes care of 21 of those 125. Each of the five large Welsh EMS includes a similar number of SPAs and SSSIs. If Wales really had 125 discrete, well-managed MPAs we'd be exceptionally well provided for: we don't. In reality we have a handful of MPAs and most are far from well enough managed or effective – as the Countryside Council for Wales's 2012 reports on MPA management to WG made abundantly clear.

The report from the MCZ Task and Finish Group accompanied the Minister's statement. This report faithfully mentioned the divergence of consultee views, but it neglected to include the analysis of MCZ consultation responses that had been in a draft provided to the Stakeholder Group, or to note that 81% of responses supported MCZ designation. Instead it laboured minority beliefs that MCZs would negatively impact on Wales's maritime economy. Bearing in mind this Group included just two conservation representatives but three WG officers (two fisheries) amongst its seven members, its recommendations to dismiss the proposed sites and to repeat much previously completed work are less than surprising. Yet both the statement and the report had conspicuous omissions.

Skomer MNR was not mentioned in the statement, but the pronouncement that all proposed MCZs were being withdrawn prompted BBC Wales news to report under the headline *New marine zone plans scrapped by minister* that "Skomer was one of the proposed zones but the minister will now look at the 125 existing marine areas." Cue confusion for the public and a splendid potential excuse for anyone intent on mischief-making.

The merger of Welsh Government's marine and fisheries functions, in a new Marine & Fisheries Division within the WG Agriculture and Food portfolio, is another indication of political priorities. Eight of the ten short-term priority tasks for the new division's initial six months are fisheries actions. Alun Davies describes the sea as a "living resource" with "significant sustainable economic potential", albeit "needing careful management"; and the only sector he identifies for helping WG deliver a "healthy and productive" marine environment is the fishing industry. And observe that although the now compulsory word "sustainable" is used, it is associated with the economy and not the environment.

Nevertheless, Alun Davies reassures us that he is "aware of some elements that may need strengthening" and promises to "outline" any necessary changes in a Marine and Fisheries Action Plan scheduled for November. I assume and hope he is speaking about environmental protection and wildlife conservation so I guess we mustn't give up hope yet. But I'm still not holding my breath ..... watch this space.

***Blaise Bullimore** is a European Marine Site Officer, consultant and Skomer MNR Honorary Warden.*

Islands round-up

Two goodbyes

Two respected island-goers have died this year. Firstly, in March, Mary Gillham died aged 91. After a formative five years in the Women's Land Army, she read agricultural botany, followed by a PhD on the vegetation of seabird islands, at Aberystwyth. In her 2004 book Memories of Welsh Islands she described her first visit to Skokholm in 1947, when Peter Conder was the warden at the Bird Observatory. After post-graduate botanical work on Skokholm and Skomer, she moved to study seabird islands in Australia and New Zealand, and penguin colonies on South African islands. She returned as an Adult Education Lecturer at Cardiff University in 1961, retiring in 1988.

Secondly, Robin Pratt who died in May. He began with visits to Bardsey, taken there by Bill and Penny Condry in 1953. He helped to build the Heligoland traps needed for the new Bird Observatory. Richard Farmer records in the latest Bardsey Trust newsletter *Y Cafn* that all Robin wanted to do was to live on Bardsey.

He told Richard "I bought a little boat, making my living by lobster fishing. I was there when there were 21 islanders, born and bred on the island. I was evicted by Lord Newborough". This came about as follows. "English wasn't spoken on the island, we all spoke Welsh. Wil (Evans) said Lord Newborough wanted the rent in cash, so we did that. Then every time we landed on the mainland we had to pay him for going through his land, through Cwrt (Farm). So there was a big meeting on the island and Wil said 'Robin, you tell him, you can speak his language'. So I told him what the islanders said and I was out the next week, physically evicted." After eviction, Robin took his fishing gear down to Ramsey Island where he was RSPB Warden and then farmed, before leaving to farm guanaco in the Gwaun valley near Fishguard. Latterly he was Chairman of the Pembrokeshire National Park Authority and a Council member of CCW.

Birds and cetaceans

The island blog from Ramsey reports that common dolphins joined a boat trip out to Grassholm on 18th June, with good film clips of them bow-riding the vessel. There were 20 in Ramsey Sound on 20th July. Unusual birds included a Black Guillemot on 30th May, and a Montagu's harrier on 1st May. (Hopes had been raised when a much rarer Pallid Harrier left Skomer at the same time!).

The big news from Bardsey was the presence of a pod of four killer whales (orcas) on 2nd June. This very uncommon sighting made it into the Daily Post on 6th June: as the pod was about three miles to the west of Bardsey, the photos taken were not what we are accustomed to on the TV!

Five days after the orcas, a really rare bird turned up – a Paddyfield Warbler. This relative of the Reed Warbler breeds no nearer than Romania, and winters in India. This was the third for Bardsey and the fourth for Wales.

Bob Normand

Celebration

Bardsey Bird and Field Observatory celebrated its 60th birthday at Prenteg (near Porthmadog) in July. The more elaborate event ten years ago was held on the island, but at present there is no boat big enough to get all those wanting to attend across to Enlli. It is rumoured that Colin Evans is planning to build a larger boat which will take more passengers: roll on the 75th birthday!

Geoff Gibbs

Steve Culley

Black guillemot *Cepphus grylle*

Giving Nature a hand: Natura 2000 species and habitats

It's easy to forget that you don't have to travel to remote corners of the Earth to witness spectacular wildlife. We have it on our doorstep, within our reach. Recently my family and I strolled around Glannau Ynys Gybi, or Holy Island Coast. A stretch of rugged coastline along the north western tip of Ynys Mon, this is a special place, a Special Area of Conservation (SAC) for vegetated sea cliffs and dry heath, and a Special Protection Area (SPA) for that iconic Welsh bird the chough, which we saw wheeling along the coast.

The European Habitats and Birds Directives offer high level protection, termed Natura 2000, to Europe's most threatened biodiversity in a network of sites that spans the continent. Throughout the uplands, woodlands, freshwater and marine habitats of Wales there are 92 SACs and 20 SPAs covering around 700,000ha. We have a big responsibility to look after them and to get it right. Unfortunately around 60% of designated habitats and species features are in unfavourable condition, so if we want these areas to continue to act as the corner-stone of conservation in Wales, now is the time to prioritise our efforts and consider new approaches and funding sources.

The LIFE Natura 2000 Programme, which is led by Natural Resources Wales and co-funded by the EU's LIFE+ Nature scheme, is working with organisations across the country to produce a strategic plan for the management and restoration of Natura 2000 sites over the next decade. The challenge is to bring protected habitats and species into favourable condition. The Programme will identify all actions required up to 2020 and beyond, and establish strategic priorities, costs and potential funding sources.

The project team have completed an analysis of current issues and potential risks that face Natura 2000 species and habitats. Results show that the five most frequently occurring issues identified across Wales are: water pollution, inappropriate grazing (too much or too little), air pollution, changes in water management, and invasive species.

Of course, as you look at a more detailed level (individual features, groups of features, or ecosystems) other issues come to the fore, such as the impact of recreational activities, marine litter, coastal flood defence and erosion control (including coastal squeeze).

An essential part of this process is consultation with representatives of organisations with an active interest in managing or using Natura 2000 sites. In a series of workshops held across Wales in June, 77 delegates contributed invaluable expertise and opinion.

The LIFE Natura 2000 team analysed a long list of management mechanisms available to address issues and risks. These included direct management, byelaws, discharge consents, management agreements, regulating orders for fisheries, and agri-environment schemes. The success of these mechanisms depends upon the support of landowners and other users, and the availability of resources to implement them. The full results are published on the project web pages.

Over the coming year the Programme will be producing costed and prioritised Action Plans for every Natura 2000 site in Wales, as well as for cross-cutting themes such as air pollution or climate change. We will also be investigating new ways to facilitate and fund essential work, and identifying where work on Natura 2000 can bring co-incidental socio-economic benefits and ecosystems services.

The Programme will be complete by the end of 2014, and by then the difficult part will have begun – implementing the plans. This can only be achieved through the sign-up, support and commitment of relevant stakeholder organisations in the public, private and voluntary sectors.

Safeguarding and, where required, restoring habitats and species of Natura 2000 sites matters for the wildlife which depends on these sites, and for people. Anyone who has been fortunate enough to watch otters fishing, experienced the remoteness of an upland blanket bog, listened to the whoops of echo-locating lesser horseshoe bats, or watched a pod of bottlenosed dolphins will understand why.

For more information contact the project on 01248 385797 or **hayley.macdonald-jones@naturalresourceswales.gov.uk**

Kathryn Hewitt *is LIFE Natura 2000 Programme Manager.*

Isn't it funny how bees like trees?

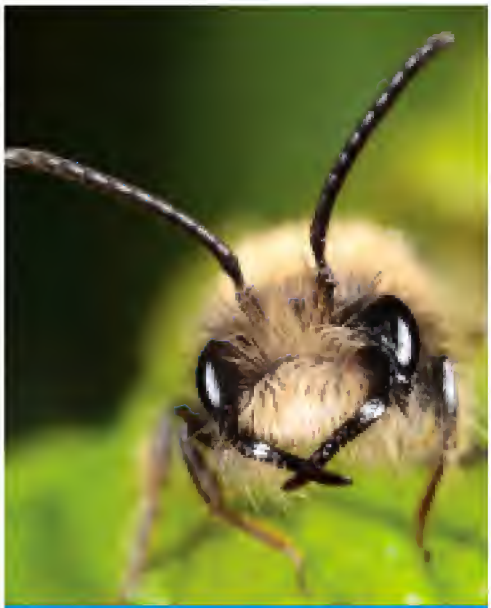
There has never been greater concern about threats to pollinators. But although much uncertainty remains regarding the causes of the decline in bee populations, the Woodland Trust (Coed Cadw) has embarked on a project to encourage Wales's farmers and landowners to take practical action to help, by planting the right kind of trees in the right places.

The Trust in Wales is offering subsidised pollinator packs, each containing 210 native trees of species specially selected to provide a food source: hawthorn, blackthorn, goat willow (though grey willow may be substituted), crab apple, hazel, dog rose and rowan. These are available for just one third of the actual cost of the packs themselves, around£60 + VAT. The trees come with spiral guards and canes to protect them from rabbits, but the landowner will need to provide stock-proof fencing. The first packs will be dispatched this autumn.

A new and specifically Welsh initiative, these packs were officially launched by Alun Davies AM at this year's Royal Welsh Show .

But are trees really so beneficial for bees? Bee-keepers seem to think so. In her book *The Pollen Loads of the Honey Bee*, Dorothy Hodges states very clearly: "In very early spring, when fresh intake of pollen is vitally necessary, and when at the same time the bees are limited by temperature to short distance flights, every flower within reach of the hive becomes important, and in particular the flowering trees. Even a few of these trees near the hive provide a vast foraging area."

Richard Becker



Adult tawny mining bee

For crops requiring insect pollination, such as oilseed rape and field beans, windbreaks provide shelter for pollinator activity, particularly where shelter trees are integrated into existing hedges. Shelter belts provide food and habitat for pollinating insects, and are used as 'highways' for the movement of bees of all types, hoverflies and other pollinators. And bee-keepers tell us that the type of habitat, nectar and pollen that is important to the honey bee is equally important to all pollinators.

But the sourcing of trees is a tricky business. Only recently has it become clear that many of the saplings offered for sale by UK nurseries in the recent past have been grown abroad, even where UK-sourced seed was used. In response to this the Woodland Trust has made a firm commitment to purchase only trees which we are 100% confident are UK-grown and, as far as it is possible to say, disease-free. We are therefore entering into long-term contracts with UK tree nurseries and seed suppliers to enable them to plan ahead to grow the trees we will need. Indeed, because it is difficult for us to be certain about how many trees we will plant in future years, we intend to over-order, on the basis that any remaining trees can be sold within the UK, thus helping support the UK industry. The Trust has long been committed to using UK provenance trees, but we believe there are strong conservation reasons to ensure that new woods have a broader genetic base, as this may allow more resilience in the face of threats such as climate change and pests and diseases. Our position statement on this is available at **woodlandtrust.org.uk/policies**. The trees in the pollinator packs are actually propagated at Cheviot Trees near Berwick-upon-Tweed.

If you know someone who might be interested in one of these packs, why not suggest they apply for one at **woodlandtrust.org.uk/wales**.

***Rory Francis** is Communications Officer at Coed Cadw – The Woodland Trust.*

Diwrnodau Gwaith Gwirfoddol Cymdeithas Eryri: Dewch i helpu Eryri

Snowdonia Society Volunteer Workdays: Do your bit for Snowdonia

Gwnewch amrywiaeth o dasgau, yn cynnwys cynnal a chadw llwybrau, casglu sbwriel, rheoli cynefinoedd, plannu coed ac arolygon o famaliaid.

Complete a range of tasks including footpath maintenance, litter picks, habitat management, tree planting and mammal surveys.

A wyddoch chi am unrhyw unigolion neu grwpiau o bobl ifanc 14-25 mlwydd oed? Holwch am ein prosiect "Active Eryri" a gefnogir gan Gwirvol.

Do you know of any groups or individuals of young people aged between 14-25? Ask us about our "Active Eryri" project supported by Gwirvol.

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